



# Ouray National Wildlife Refuge

## Draft Comprehensive Conservation Plan and Environmental Assessment

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# ***Introduction/Background***

In the Uintah Basin of northeastern Utah lies the 11,987-acre Ouray National Wildlife Refuge. Located about 30 miles southwest of Vernal, the Refuge protects riparian woodland, bottomland wetlands, and grasslands bordering the Green River (see Map 1 and 2). Geographically, the Refuge is long and narrow covering about 19 square miles. The Refuge was established on May 25, 1960, under authority of the Migratory Bird Conservation Act of 1929 and Public Land Order 2730, and land acquisition was initiated in 1961 using Duck Stamp funding. Most of the acreage is owned in fee title (5,032 acres), 3,110 acres was transferred from the BLM, 2,692 acres is leased from the Ute Tribe, and 1,153 is leased from the State of Utah (see Map 3).

The Refuge was originally established to provide prime breeding, resting, and feeding areas for migratory waterfowl. Early in its history, much of the Refuge's floodplain and wetland habitats were altered with the construction of dikes and levees to gain control over seasonal water flow from the Green River. Impounded marsh units were created to provide secure water, food, and nesting cover for waterfowl. Since the construction of Flaming Gorge Dam upstream, the Green River system has changed dramatically resulting in long-term loss and degradation of riparian habitats and wildlife species dependent on them. The Refuge's riparian habitat is now critically important to protect declining fish and migratory bird species using the Green River corridor.

The greatest challenge in managing the Refuge lies in determining the area's optimum ecological potential given past and present human intervention. Refuge managers will be required to perform a balancing act in managing for all trust species. Numerous uncertainties exist over the habitat's potential to be restored in the presence of human-regulated river flows and the overabundance of nonnative plants and animals. The newly proposed management direction will require collection of additional historic (both pre- and post-Flaming Gorge Dam construction) and present day vegetative and wildlife inventories and habitat structure and composition data. Past emphasis on waterfowl production had very little need for this data and it is not presently available to the Refuge staff. A need also exists to further study levee removal modifications and to assess keeping man-made impoundments and the 150 acres of croplands. It is feared that if abandoned, these intensively altered sites will become dominant stands of nonnative vegetation. Modern day invasive species control technology, and limited resources offer no reassurance that these areas can be restored. This Plan identifies, through goals and objectives, some of the sites which presently lend themselves to restoration. The Refuge presently lacks much of the data needed to pursue large scale restoration, so proposes to collect information on which to base well informed management decisions. Some of the man-made impoundments cannot be restored without posing serious problems to existing roads, water control structures, fences, public use facilities, and buildings. It is anticipated that the accomplishment of the identified goals will require much, if not all, of the 15-year planning period.

# *Refuge Overview*

## History of Refuge Establishment, Acquisition, and Management Purpose and Need for Plan

The U.S. Fish and Wildlife Service (Service) is the principal Federal agency with responsibility for conserving, protecting, and enhancing fish and wildlife and their habitats. The Service manages a diverse network of more than 500 national wildlife refuges, a System which encompasses over 93 million acres of public land and water which provides habitat for more than 5,000 species of birds, mammals, reptiles, fish, and insects.

Comprehensive conservation plans (CCP) were mandated by the National Wildlife Refuge System Improvement Act of 1997. The Act requires that all lands and waters of the National Wildlife Refuge System (System) be managed in accordance with an approved CCP that guides management decisions, sets forth strategies for achieving Refuge purposes, and contributes to the System mission. This CCP establishes the goals, objectives, and strategies that will guide the management of Ouray National Wildlife Refuge for the next 15 years. It will serve as the basis for more detailed step-down management plans and budgets. The Plan is comprehensive in the sense that it addresses all activities that occur on the Refuge, though activities and strategies are stated broadly. Detailed descriptions of strategies or activities will appear in step-down plans. Refuge objectives are established based on the Refuge purposes, other Federal laws, National Wildlife Refuge System goals, Service policies and directives.

The Refuge was originally established as a prime waterfowl production area which would also provide needed resting and feeding areas for migratory birds traveling along the Green River corridor. The current management strategy of the Refuge takes into account new biological information and insight into the importance of western riparian and floodplain systems to a variety of fish and wildlife species. Human demands on water resources have resulted in loss, alteration, and degradation of riparian habitats. The species dependent upon such river systems have declined throughout the western states, contributing to population declines of the bald eagle, peregrine falcon, whooping crane, Uintah Basin hookless cactus, and four species of fish native to the Green River. All these species have been placed on the federally threatened and endangered species list since the Refuge was established in 1960.

Managers now realize that Refuge floodplains cannot easily be transformed into wetlands intensively managed for waterfowl production. The riparian corridor, overlooked as a major habitat type in the early 1960's, is critical and supports tremendous biological diversity (Knopf et al., 1988). The listing of the razorback sucker and Colorado pikeminnow in 1987 has posed new required management considerations under the Endangered Species Act of 1973. The proposed plan will de-emphasize waterfowl production and shift management emphasis toward enhancement of riparian and wetland habitat for waterfowl, other migratory birds, and endangered fish species.

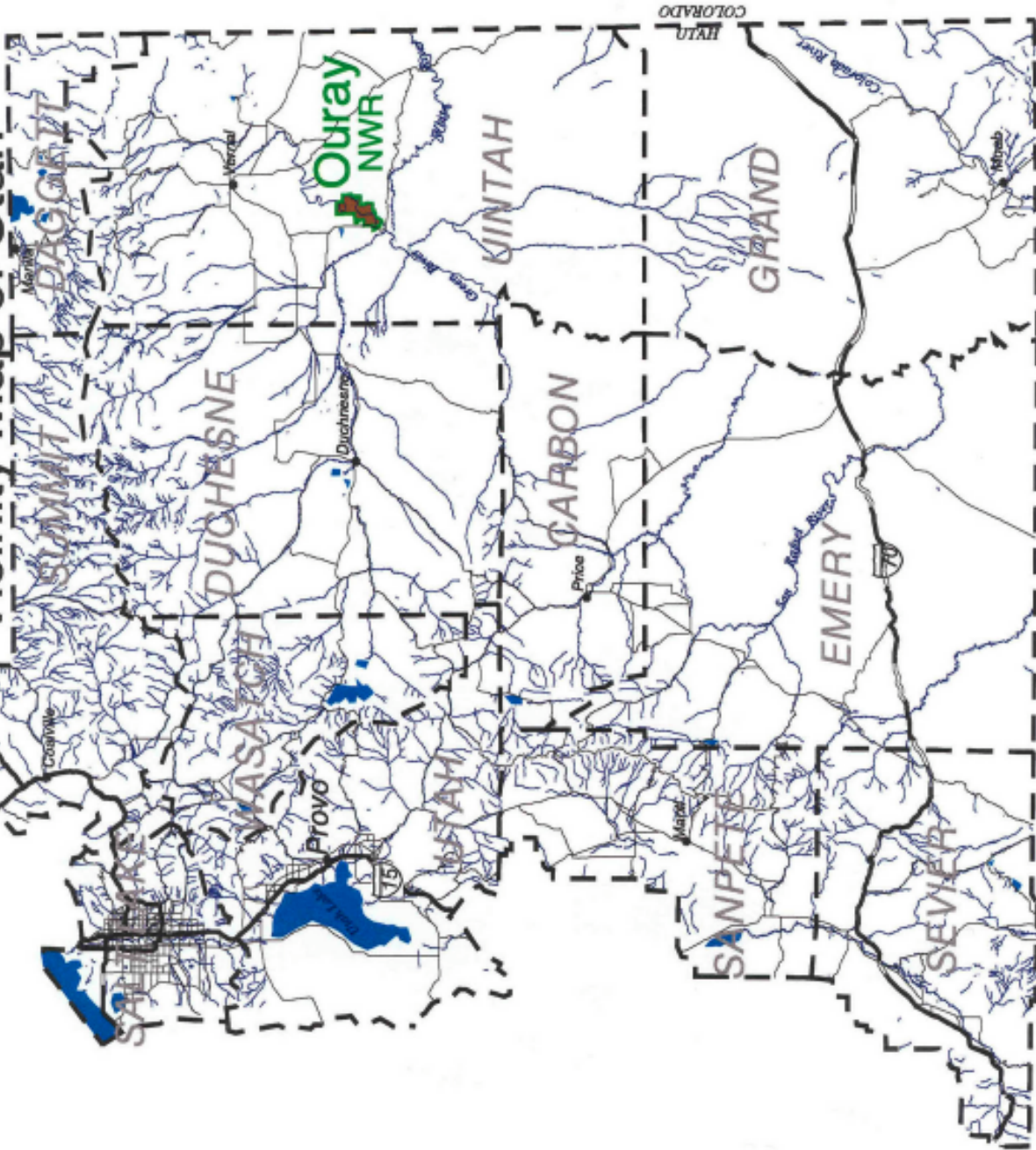


Map Location



State of Utah

## Vicinity Map of Utah



Map # 1 Vicinity Map



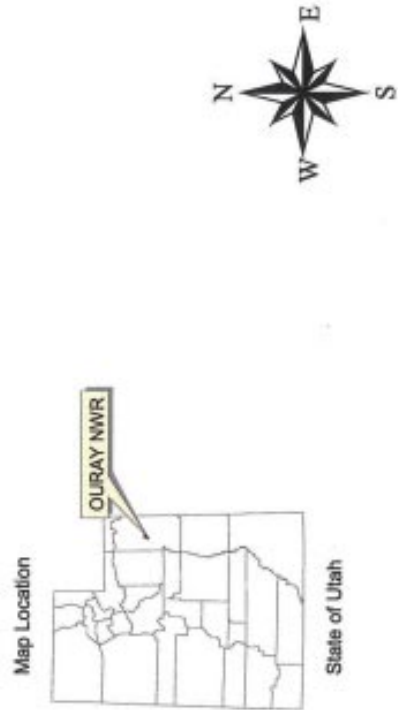




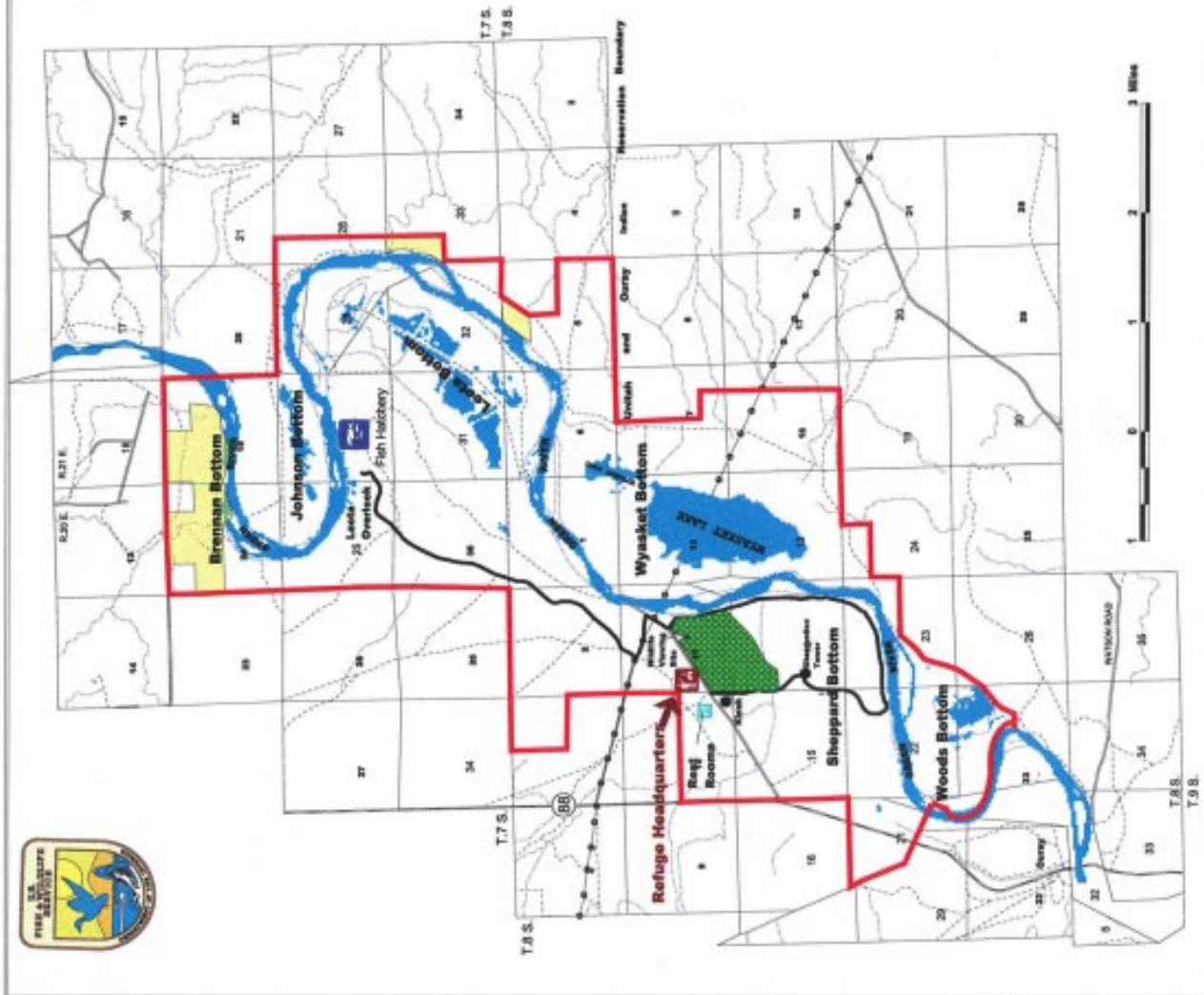
# Ouray National Wildlife Refuge Base Map

## LEGEND

- Closed to Public Access
- Private Lands
- Open Water
- Ouray NWR Boundary
- Improved Roads
- Unimproved Roads
- Auto Tour Route
- Highway
- Intermittent Streams
- Pipeline



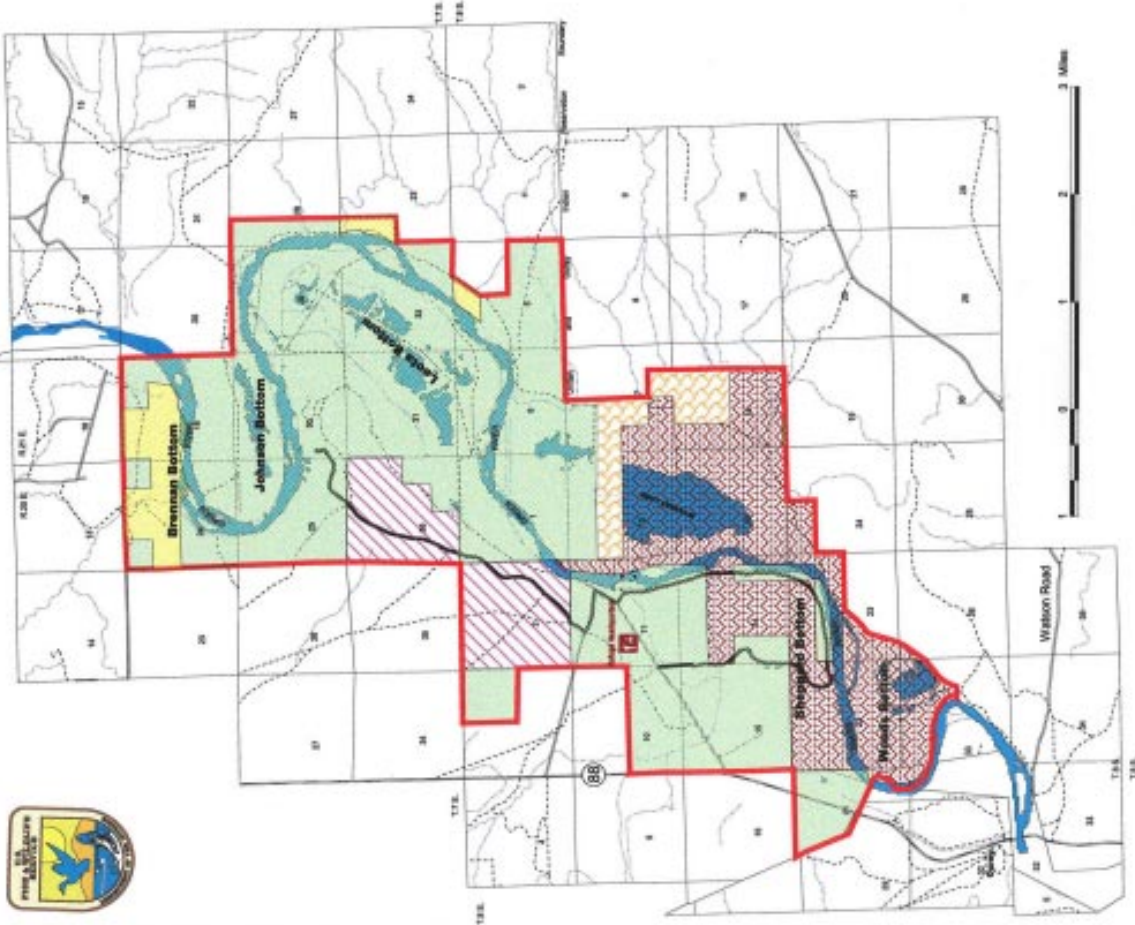
Map # 2









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# Ouray National Wildlife Refuge Landownership Map



## LEGEND

-  Tribal Lease to U.S. Fish and Wildlife Service
-  Leased Tribal Lands
-  U.S. Fish and Wildlife Service Lands
-  State Leased Lands
-  Private Lands
-  Ouray NWR Boundary

Map Location



State of Utah



Map # 3

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## NWRS Mission

The Mission of the National Wildlife Refuge System is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.”

## Refuge Purpose

The Ouray NWR was established on May 25, 1960, by the authority of the Migratory Bird Conservation Act of 1929. Land acquisition was initiated in November 1960, and the Refuge became operational in late 1961 for “use as an inviolate sanctuary, or for any other management purpose, for migratory birds.”

## Refuge Vision Statement

The Green River corridor is a ribbon of riverine, riparian, and seasonal wetland habitats threading through the arid desert lands of southwest Wyoming, northwest Colorado, and eastern Utah. Historically many species of birds and other wildlife depended on this corridor for navigation and provided a chain of feeding and resting areas along their migration paths each year. Because of a broad array of changes in land-use and water development projects in the western states, riparian habitats are now rare, and the species dependent on them in decline (Howe and Knopf 1991).

The most vital contribution Ouray National Wildlife Refuge can make to the Upper Colorado River Ecosystem (UCRE) is to restore and enhance riparian woodlands and seasonal wetlands along its 12 River miles. The 11,987-acre Refuge will be managed for a variety of native plants and wildlife with emphasis on migratory birds, threatened and endangered species, and compatible wildlife-dependent public use. The Refuge welcomes visitors and will provide them with opportunities to understand and appreciate the vital role riverine systems play in the arid west. Opportunities for wildlife-dependent recreation such as wildlife observation, photography, hunting and fishing will also be provided. Information generated from the research conducted under this Plan will enhance understanding and cooperation among local land-use interests, residents, and management agencies. The Refuge will work with individuals, organizations, and agencies to promote wildlife conservation in the Green River Basin. As a result, the unique biological resources, and natural beauty of the Green River will be enhanced and restored for future generations.

## Legal and Policy Guidance

Refuges are guided by the mission and goals of the National Wildlife Refuge System, the Refuge purpose as described in its establishing legislation, executive orders, Service laws and policy, and international treaties. Key concepts and guidance for the System are covered in the System Administration Act of 1966, the Refuge Recreation Act of 1962, Title 50 of the Code of Federal Regulations, the Fish and Wildlife Service Manual, and, most recently, through the National Wildlife Refuge System Improvement Act of 1997. Appendix E contains a partial list of other Federal laws governing the administration of the System.

# *Planning Process*

## Description of Planning Process

The Ouray National Wildlife Refuge Comprehensive Conservation Plan is guided by the established purposes of the Refuge, the mission of the National Wildlife Refuge System, Fish and Wildlife Service compatibility standards, other Service policies, plans and laws directly related to Refuge Management. This Plan establishes the goals, objectives, strategies, and monitoring and evaluation for the Refuge.

The Plan will be used to prepare step-down management plans and revise existing plans, performance standards and budgets which describe specific actions to be taken by the Refuge. The effects of major management actions will be monitored and evaluated to provide information to future managers as to the result of actions taken.

Issues addressed in this Plan were identified by the public, Refuge staff, and cooperating agencies. A formal effort was made to obtain input from local residents, Refuge visitors, and from individuals who have expressed interest in the Refuge. Public comment was solicited through an open house held at the Refuge on April 27, 1996; a news release was sent to public officials, local, State, and other Federal agencies, local groups and interested individuals, and the circulation of questionnaires.

The duration of the CCP is 15 years; however, the Plan may be revised if necessary within that time. The CCP will supersede the Refuge Master Plan written in 1962.

## Planning Issues and Opportunities

Four issues are of particular concern when planning future management actions for Ouray NWR. These include degradation and loss of riparian habitat, invasion of nonnative plants, selenium control, and mosquito production.

## Riparian Restoration and Overbank Flooding

The use of overbank flooding as a management option has become an issue for the Refuge and for the Green River in general. Periodic high River flows helped create and maintain bottomland wetlands (bottoms) in low areas adjacent to the River (Cooper and Severn 1994). These wetlands historically supported many species of wildlife such as endemic native fish and migratory birds. Now that much of the River course is controlled by levees and the Flaming Gorge Dam, overbank flooding is a rare event (FLO Engineering 1996). Special status wildlife species that depend upon these wetlands during part of their life cycle are the endangered Colorado pikeminnow (previously known as Colorado squawfish) razorback sucker and the bald eagle. Three of four endangered Colorado River fish are found in the Green River near the Refuge, and two of them have been found in Refuge wetlands (Modde 1997, Modde and Wick 1997, Modde and Irving 1998).

In the fall of 1997 and spring of 1998, the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program), in cooperation with the Refuge, breached levees in Woods Bottom, Leota Bottom, and Johnson Bottom to evaluate habitat and wildlife responses to a planned seasonal floodplain inundation. Responses by nonnative and native fish, other wildlife, and plants are being recorded to gauge the effects of reestablishing overbank flooding.

## Nonnative Plants

Ouray NWR, like most modified landscapes, has been invaded by a variety of nonnative plants, some of which were introduced as ornamental plants. Nonnative plants usually flourish in disturbed landscapes and tend to out-compete native plants (Di Tomaso 1998, Olson 1999). The current River flow regime and other on-site modifications or limitations (e.g., lack of independent water control to manipulate varying water depths or flood regimes within units) does not favor native riparian plant communities and contributes to the spread of nonnative species (Laubhan 1997). As a result, less habitat exists that supports native wildlife (Trammel and Butler 1995, Schmidt and Whelan 1999) resulting in either smaller population sizes or less diversity in species that are native to the River corridor (Knopf and Olson 1984, Kerpez and Smith 1987, DeLoach 1989). Additionally, many nonnative plants alter the physical characteristics of the system. Some species change the chemical profile of the soil (Di Tomaso 1998) or increase soil erosion, sedimentation, and flooding that are better minimized by native vegetation along riparian areas (DeLoach 1989, Sheley et al. 1995, Wiesenborn 1996). The nonnative plants of major concern to the Refuge are: saltcedar (*Tamarix sp.*), perennial pepperweed (*Lepidium latifolium*), Russian-olive (*Elaeagnus angustifolia*), and Russian knapweed (*Centaurea repens*).

The exact degree of infestation and species composition is presently unknown. A current cursory estimate on the degree of infestation by species and bottom site is shown under Goal A, Objective 1. The Refuge staff recognizes the need to map and identify the degree of infestation and species composition as a means of baseline information on which to gauge efforts being carried out. The Refuge staff is proposing the use of a Global Positioning System (GPS) and Geographic Information System (GIS) to record and map infestations as one of its strategies within Goal A.

Current invasive weed management techniques being employed include both mechanical and chemical techniques. The only biological control agent currently available for species known to occur on the Refuge is a soil nematode (*Subanguina picridus*) for Russian knapweed. The Refuge staff experimented with the nematode with very little success. The staff works closely with the Uintah County Extension Office, Uintah County Weed Department, and other land management agencies in an effort to improve communications and control techniques.

The Uintah County Weed Department annually sprays 50 acres of Refuge roadsides with a tank mix of Escort and 2,4-D amine to help control the spread of perennial pepperweed. The Refuge is currently treating salt cedar, perennial pepperweed, Russian knapweed, and Russian olive with the following techniques:

- Salt cedar - tank mix of 50 percent Round-Up and 50 percent Arsenal applied foliarly
  - experimenting with above mix on resprouts following burning
  - experimenting with straight Arsenal as a foliar application
- Perennial pepperweed - Escort/2,4-D amine 50:50 mix
  - experimenting with straight Escort (with and without mowing)
- Russian knapweed - 2,4-D amine within farm field
  - Escort/2,4-D amine on roadsides
- Russian Olive - 2,4-D Ester stump treatment
  - Arsenal stump treatment

The Refuge staff continues to experiment with numerous techniques which have been researched and proven to work in other states.

## Selenium

Accumulation of high concentrations of selenium within the Refuge is a serious issue which poses life threatening health problems for wildlife. Selenium is a naturally occurring element found in the soil, water, and vegetation within and adjacent to Refuge lands. Selenium is essential for most living organisms but can be toxic when concentrated (Hamilton et al., 1996, Waddell pers. comm.). For the past nine years, the Service's Ecological Services Division, in conjunction with the U.S. Geological Survey (USGS), has been conducting extensive studies of selenium to determine the levels and distribution of selenium in soil, water, and wildlife in and adjacent to the Refuge. Numerous dead birds and deformed bird embryos have been found. Based on data collected thus far, selenium on the Refuge has been linked to water flows through the Roadside Draw located in the southwest corner of the Refuge and impoundments in the immediate area. Approximately \$2.5 million has been spent to minimize the flow and accumulation of water in the Roadside Draw. Despite the Service's efforts, high concentrations of selenium still occur, and data indicates farm irrigation occurring north of the Refuge leaches selenium from the soil and is discharged on the Refuge via groundwater (Waddell pers. comm.).

In an effort to prevent additional increases in water flow through the Roadside Draw, the Refuge requested that the Bureau of Land Management (BLM) consider Refuge objectives in their land-use planning of areas adjacent to the Refuge. BLM has agreed with our request and has incorporated necessary wording into the Diamond Mountain Resource Management Plan. The Refuge staff is continuing the cleanup of contaminated sites.

The Refuge, with the assistance of the Ecological Services Division and the USGS, is currently evaluating levee removal to provide dilution of the concentrated selenium. This proposal would in essence return this site to the way it once functioned prior to construction of the protective dike. This proposal involves partial removal of the Sheppard Bottom protective dike, and modification to the interior dikes of S3 and S5. A separate Environmental Assessment will be prepared in the year 2000 for this project. Please refer to the Selenium Project (Map 4) for additional information.

## Mosquitos

Refuge wetlands produce large numbers of mosquitos. This creates serious conflicts with neighboring communities and concern over mosquito borne Western Equine and St. Louis Encephalitis. The Uintah County Mosquito Abatement District (UCMAD), in cooperation with the Refuge, has applied the larvicide BTI (Bacillus thuringiensis israelensis), a biological control to Refuge wetlands, in an attempt to reduce the mosquito population. Malathion is also used, but only as a last resort when disease vectors are present, and the areas fogged are on administrative and upland sites. Refuge cooperation exists in the form of cost sharing for BTI (when the budget allows), monitoring of mosquito populations using a light trap, and providing access for monitoring and control. The Refuge cooperates with the District's effort to suppress mosquitos as long as it does not conflict with the purpose of the Refuge. In 1999, a total of 9,712 acres were treated with BTI and 170 acres were treated with malathion (the acreage includes repeat treatments of the same sites). A sentinel flock of domestic poultry located on a nearby ranch is routinely checked for mosquito borne infectious diseases.

The Refuge is also currently evaluating the use of other mosquito control chemicals including the larvicide Agnique, and community bat box construction and placement in cooperation with the Boy Scouts of America and other interested volunteers. Potential conflicts can exist between mosquito control and providing food, shelter, and cover for endangered fish and migratory birds.

The Refuge greatly appreciates the professional working relationship and the numerous accomplishments UCMAD has made on the Refuge.





# Ouray National Wildlife Refuge Selenium Project Map

Shepard Bottom (S-3/S-5) Dike - Removal



Flo Engineering Inc. gathered data for this project

Map # 4

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# ***Summary Refuge and Resource Description***

## **Geographic/Ecosystem Flyway Setting**

The U.S. Fish and Wildlife Service is organized into watershed based ecosystems (see Map 5). The Ouray NWR, Browns Park NWR in Colorado, and the Seedskadee NWR in Wyoming all lie within the Upper Colorado River Ecosystem (UCRE). All three refuges are similar in that they are located along the Green River.

The UCRE incorporates the watersheds, headwaters, tributaries, including the Green River, and mainstem of the Colorado River in Wyoming, Utah, and Colorado. The aquatic systems in this region are vital not only for native wildlife but also for millions of people in seven arid southwestern states. Once naturally diverse, many of these systems have been fragmented and degraded as a result of water development projects, land-use practices, and introduction of nonnative animals and plants. An interagency planning team met in 1994 to develop broad goals and objectives for the UCRE. Resource issues identified by the team for the Ecosystem are closely related to resource issues and concerns raised by the staff of Ouray NWR. The goals developed are:

- P Restore and maintain an aquatic system capable of supporting the diversity of native aquatic communities to achieve recovery of listed and candidate species and prevent the need for future listings.
- P Reverse the current trend (of decline in wetland and riparian habitats); restore, maintain, and enhance the species composition, the extent and spatial distribution of wetland/riparian habitats.
- P Promote terrestrial biological diversity and ecosystem stability through sound land management practices thereby avoiding fragmentation, degradation, and loss of terrestrial habitats.

Ouray NWR is also included in the Intermountain West Joint Venture region of the North American Waterfowl Management Plan. Other regional wildlife resource planning efforts which may affect management of the Ouray NWR have been conducted by the Service, other Federal agencies, States, and conservation interest groups. Such initiatives also include cooperative management plans for Pacific Flyway migratory bird species. Species for which plans exist include the Rocky Mountain population of Canada goose, western Canadian Arctic snow goose, Pacific Flyway Ross' goose, Rocky Mountain population of trumpeter swan, western population of tundra swan, Rocky Mountain population of greater sandhill cranes and Western Management Unit of mourning dove.

The Refuge lies within the Uintah Basin, a subdivision of the Colorado Plateau physiographic province. Refuge habitats include about 19 square miles of riverine, riparian, and upland habitats. Benchlands are held up by upper strata of the Uinta Formation, which form rounded and sculptured bluffs bordering the River valley. Pleistocene and earlier terrace gravel cover the benchlands. Bottoms and alluvial fans derived from the benches cover the margins of river terraces in the valley. Elevation ranges from 5,072 feet above sea level atop Leota Bluff, to 4,650 feet along the Green River at the south end of Sheppard Bottom.

In some years, the Refuge area receives suitable flows from the Green River and the Yampa River to adequately flood critical floodplain habitat for the endangered Colorado River Fishes. The Refuge serves as a partner and cooperator in the Recovery Program. Many of the necessary habitat conditions required by the endangered fish are also conducive to migratory bird management.

## Refuge Habitats

National, regional, and local efforts have been made to simplify, standardize, and describe habitat classifications. For example, Cowardin et al. (1979) developed a classification system for wetlands and deepwater habitats in the United States. In 1997, Dall et al. proposed a system for mapping riparian areas in the western United States. More specifically, Hansen et al. (1995) developed a classification for Montana's riparian areas. To be directly useful for management, classification and identification of certain habitats and areas must be gleaned from these existing systems but refined for a particular management area (i.e., Ouray NWR). On the Refuge, three general habitat categories occur: riverine, riparian, and uplands. The following defines and describes these general habitat categories, including improvements or developments within riparian areas. Specific impoundment surface acres, capacities, and maximum pool elevations are shown in Table 1.

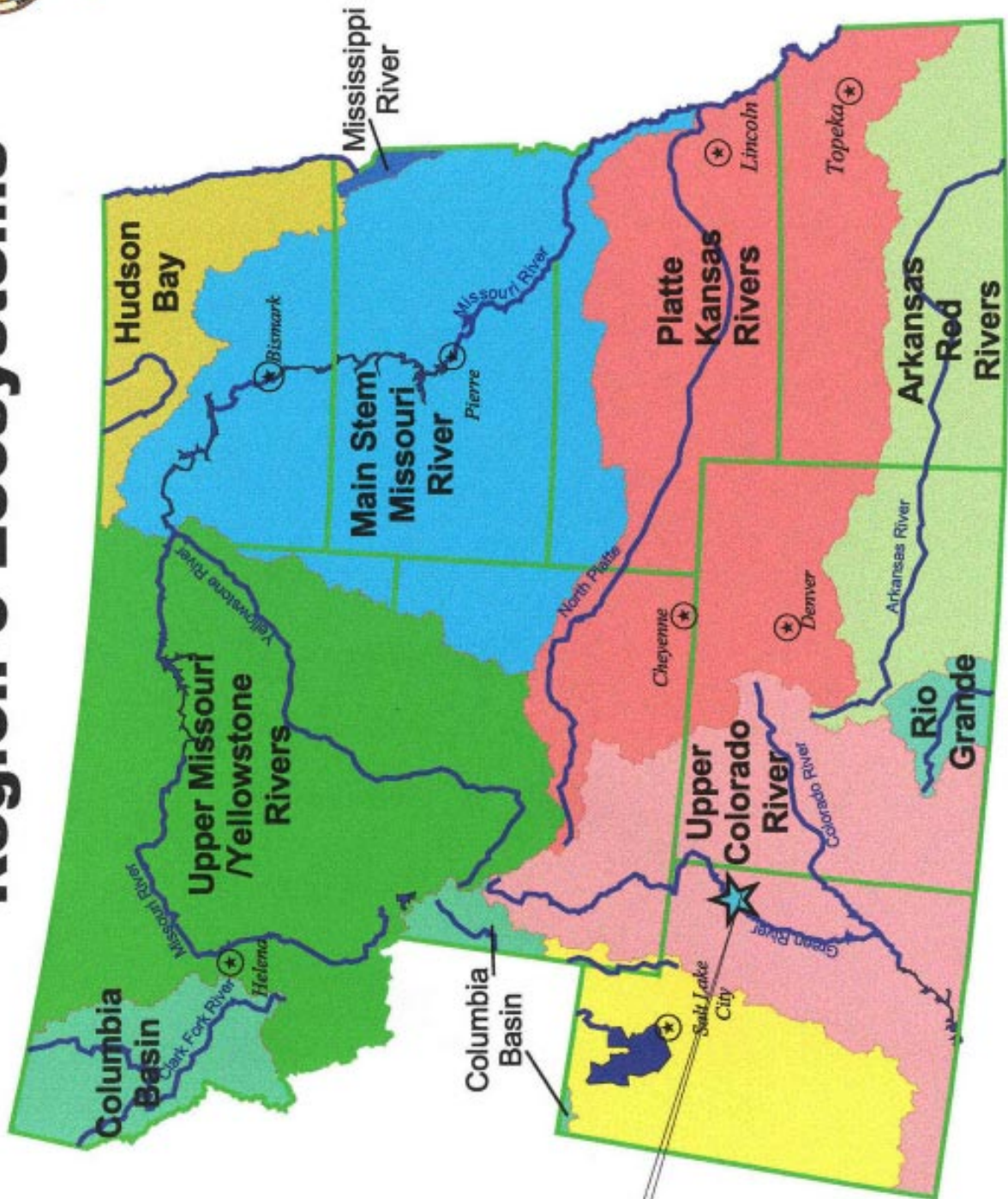
<b>Table 1. Ouray NWR Wetland Area/Capacity Elevation Table*</b>			
Pool Designation	Pool Capacity Surface Acres	Pool Capacity Acre-Feet	Full Pool Elevation
J-1	31	42	4667.00
J-2	41	74	4666.00
J-3	58	35	4666.00
J-4	<u>16</u>	<u>16</u>	4666.00
	146	267	
L-1	57	157	4668.00
L-2	88	230	4668.00
L-3	107	382	4666.00
L-4	84	340	4666.00
L-5	80	222	4663.00
L-6	99	362	4664.00
L-7	120	275	4662.00
L-7A	20	40	4662.00
L-8	118	289	4662.00
L-9	83	227	4662.00
L-10	<u>151</u>	<u>553</u>	4664.00
	1016	3077	
P-1	12	11	4656.00
P-2	10	10	4656.00
P-3	8	8	4656.00
P-4	8	11	4656.50
P-5	<u>12</u>	<u>16</u>	4656.00
	50	56	
S-1	95	177	4658.00
S-2	260	314	4658.00
S-3	217	703	4658.00
S-4	70	196	4658.00
S-5	<u>129</u>	<u>399</u>	4658.00
	771	2200	
Woods Main	309	850	4655.00
Woods Back	<u>91</u>	<u>124</u>	4655.00
	400	974	
Wyasket Pond	253	644	4663.00
Wyasket Lake	<u>1393</u>	<u>3267</u>	4661.00
	1646	3911	
Total AC/CAP:	4029	10485	

\*Based on FLO Engineering's Ouray NWR Bottomland Sites Elevation/Area/Capacity Tables Final Report (Revised 8/97)



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# Region 6 Ecosystems



**Refuge Location**



Map # 5 Ecosystem Map





## Riverine

Riverine, as defined by Cowardin et al. (1979), is any wetland or deepwater habitat contained within a channel, with the exception of wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. Within the Refuge boundary, 12 miles of the Green River meet this definition which equates to approximately 1,180 acres.

The Green River watershed encompasses 45,000 square miles, originating in Wyoming's Wind River Range and stretching 730 miles through Colorado and finally connecting to the Colorado River in Canyonlands National Park, Utah. The northern Refuge boundary begins approximately 120 River miles downstream from Flaming Gorge Dam. The Green River receives additional flows from the unregulated Yampa River that lies between the dam and the Refuge, with an average of two flow peaks per year (Collier et al. 1996, Laubhan 1997).

The dam, erected in 1962, has forever altered the timing of flows (see Figure 1 and 2 for pre- and post-dam flows). Historically, the Green River would begin to rise in March, peak in June, and decline in July. Many native fish species found nowhere else evolved with this variability in River flow and sediment concentration and temperatures specific to the Green River. Under influence of Flaming Gorge Dam, the Green River's high flows now coincide with releases to power peak electrical demands of summer and winter, but the total amount of water released per year has not significantly changed (Collier et al. 1996). Daily peak electrical demands result in daily River flow fluctuations that can be as extreme as 1.5 feet per day as recorded 107 miles downstream from the dam at Jensen, Utah (Valdez 1989). Even though these present-day permutations present obstacles to endangered fish recovery and habitat restoration, the Green River continues to be the lifeline of Ouray NWR and its flora and fauna.

## Riparian

Riparian as defined by Dall and others (1997): "...are plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (rivers, streams, lakes, or drainage ways). Riparian areas have one or both of the following characteristics: 1) distinctively different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland." (See Map 6 and 7).

National Wetland Inventories (NWI) following the Cowardin and others (1979) classification have recently been completed for Ouray NWR. However, these data are based on 1983, color infrared (CIR) aerial photography. This particular year saw the onset of a 100-year flood event. Therefore, the information gleaned from the NWIs represent a best-case scenario from an ecological standpoint. For example, Hansen (1994) states that recent research has shown that most cottonwood and willow recruitment is due mainly to very large flooding events and not to average flow events. Although 100-year flood events are best-case scenarios, today, management on a daily basis is more on-line with average flows.

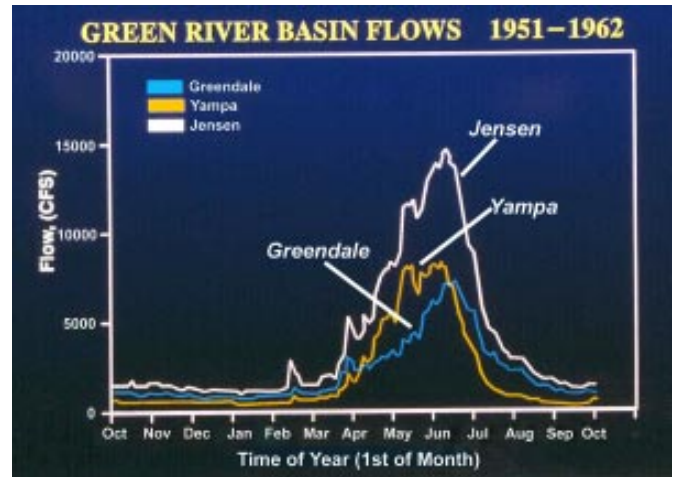


Figure 1. Pre-Dam Average Annual Flows

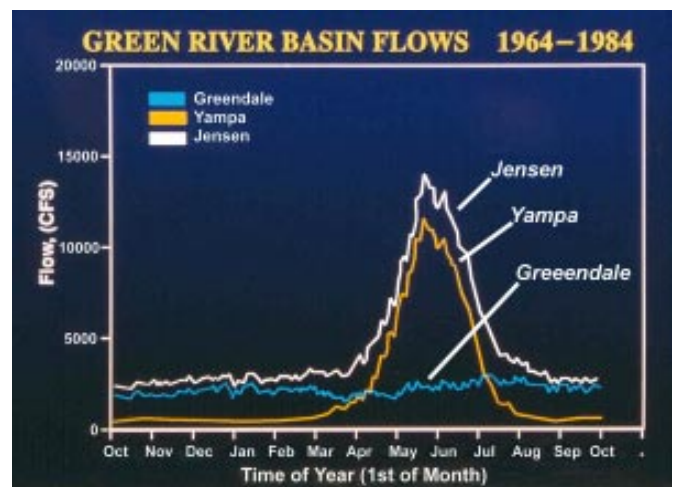


Figure 2. Post-Dam Average Annual Flows

With the exception of the NWI, no other riparian or wetland ecological site classification has been completed on or near the Refuge (Hansen 1994). Therefore in the CCP, the definition of “riparian” will follow Dall, et. al. 1997, but the data used will be from the NWI (following Cowardin 1979). Although Cowardin describes vegetation by life forms within classes such as forested (trees), scrub/shrub, emergents, etc., and since complete baseline biological inventories and other assessments (e.g., structure and composition of existing vegetation) are lacking for the Refuge, additional discussion of vegetation by bottoms is in general terms and based on casual or anecdotal observations. Additional recommendations and information have been provided during 1- and 2-day field visits and on-site assessments by Murray Laubhan (Midcontinent Ecological Science Center), Leigh Fredrickson (Gaylord Laboratory), Paul L. Hansen (University of Montana), Charlie Pelizza (Lake Andes NWR), and several others.

The CCP describes Refuge management units defined by previous Refuge staffs and that probably date back to the inception of this Refuge. These management units (previously identified as bottoms or distinct natural forming depressions between the River's edge and the uplands) are Brennan, Johnson, Leota, Wyasket, Sheppard, and Woods or Old Charley Wash.

Several intermittent streams drain the adjacent uplands located on and off the Refuge. Only the stream habitat associated with the North and South Roadside Draw near the main entrance to the Refuge will be discussed in the CCP because it has been the most impacted by human presence.

#### Brennan Bottom

Brennan Bottom is the northernmost (upstream) bottomland on the Refuge. Most of the bottomland is privately owned, but it falls within the executive boundary of Ouray NWR. All inventoried wetlands (ca. 154 acres) in Brennan are classified as palustrine (see Cowardin et al. 1979 for more information). Approximately 77 acres of seasonally flooded emergent wetlands comprise 50 percent of the classified wetlands. Other temporarily flooded wetlands are forested (51 acres), scrub/shrub (24 acres), and impounded unconsolidated shore (2 acres) (USFWS, Brennan Basin 1999). The approximately 160 acres in Refuge ownership are associated uplands (i.e., areas that are not wetlands). Uplands will be discussed in a later section. As most of the classified wetlands in Brennan are in private ownership, the Refuge has no active water management capabilities.

#### Johnson Bottom

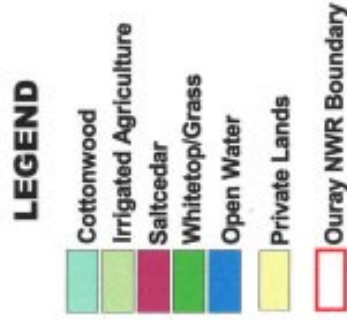
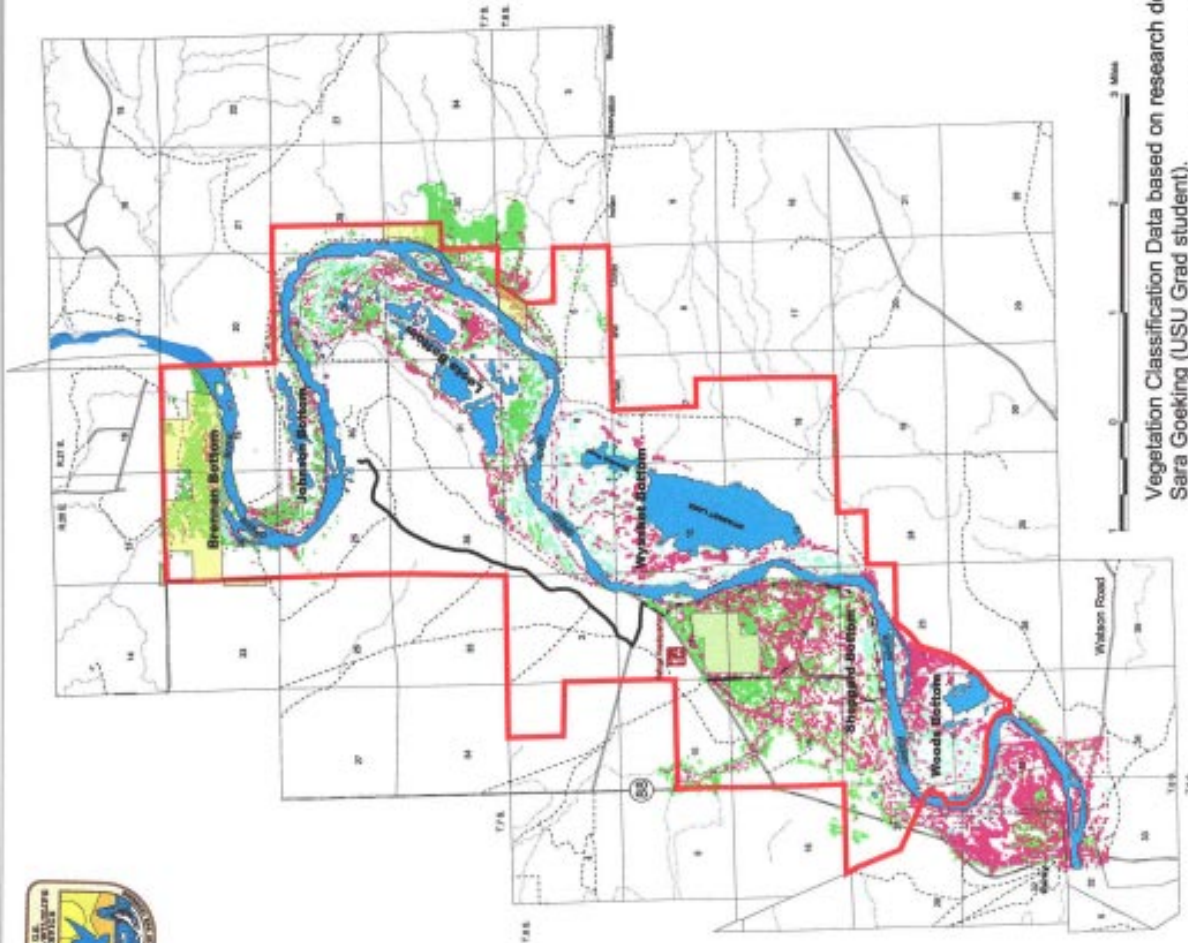
Approximately 250 acres of inventoried wetlands exist in Johnson Bottom (USFWS, Brennan Basin 1999). In 1983, 73 percent (182 acres) of the wetlands were classified as lacustrine. The lacustrine wetland is an impounded, intermittently exposed, artificially flooded aquatic bed. Presently, this represents the bulk of Johnson Bottom units J-1 through J-4. The remaining acreage (68 acres) is classified as palustrine. Specifically, three acres are artificially/temporarily impounded emergent wetlands, 21 acres are temporarily flooded forest, and 44 acres are scrub/shrub wetlands (USFWS, Brennan Basin 1999).

The four units within Johnson Bottom provide deep, open-water habitat. Aquatic submergent vegetation is currently nonexistent due to water turbidity caused by common carp. The vegetation that does occur on the outer edges consists primarily of cattail and hardstem bulrush. Although the dominance of these species is not known, other vegetation specific to the forested and scrub/shrub classifications include cottonwoods, willow species, Russian olive, Tamarix, greasewood, and sagebrush.





# Ouray National Wildlife Refuge Riparian Woodlands Map

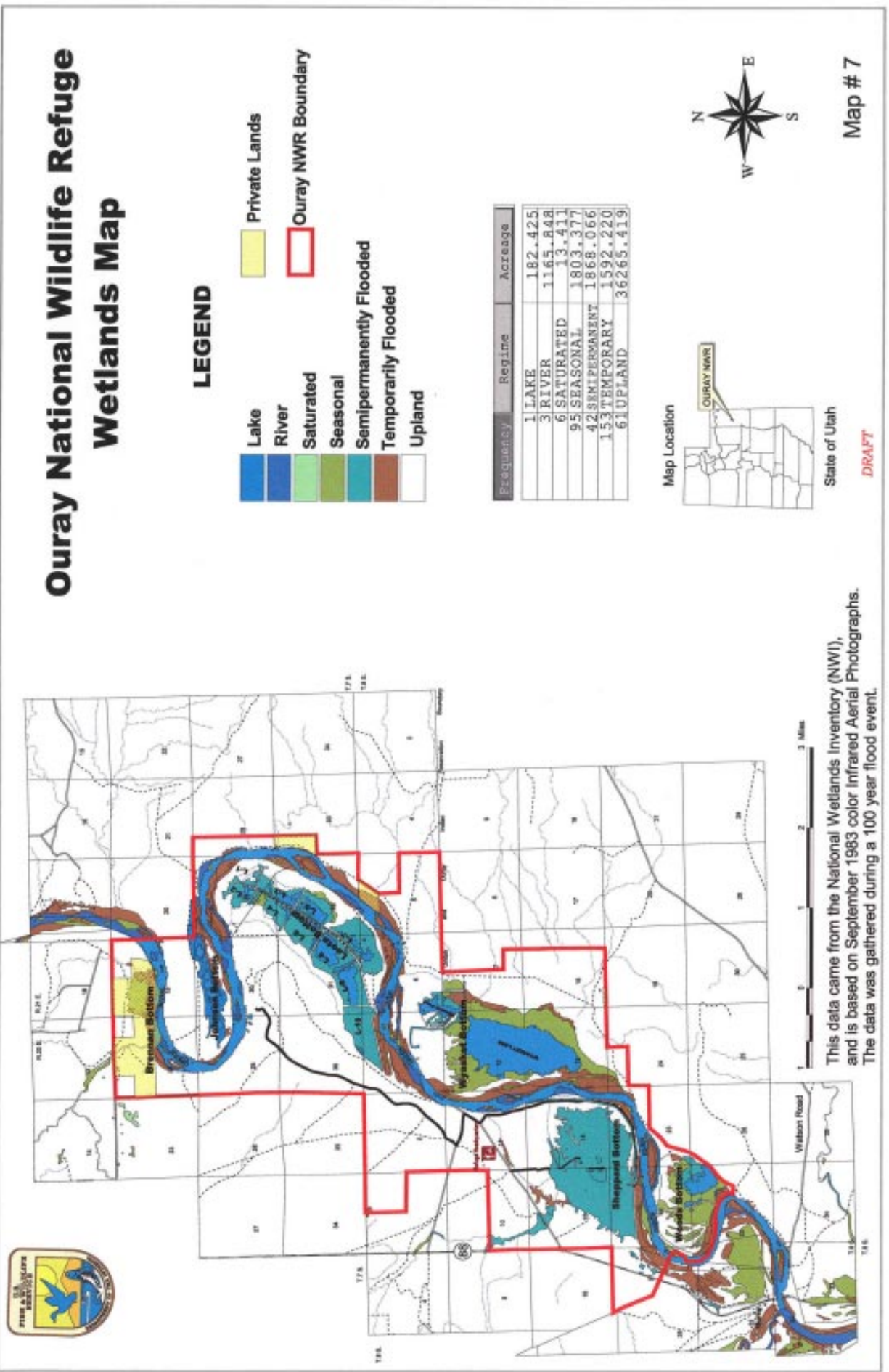


Vegetation Classification Data based on research done by  
Sara Goecking (USU Grad student).  
Some discrepancies may have occurred in her data.

Map # 6

**DRAFT**







These four man-made impoundments are essentially managed as one unit, with the gravity flow inlet coming into J-1 and Green River water fed on through to J-4. Three interior dikes that subdivide this wetland have deteriorated over the years and do not allow for independent management. A management decision was made in 1988 to remove the electric line from a permanent pump station located in this remote area. Partial levee removal along the southeast corner of J-4 was completed in March 1998 and is designed to flood at River flows of 13,000 cubic feet per second (cfs). Construction of a new drain structure/fish kettle in the southeast corner of J-3 was completed in the fall of 1999. Both projects were constructed by the Bureau of Reclamation and funded by the Recovery Program. A proposal is being considered to remove what is left of the three interior dikes that subdivide this wetland.

### Leota Bottom

More than 1,250 acres of wetlands classified as palustrine occur in Leota Bottom. According to 1983 aerial photography, temporarily flooded wetlands in Leota are emergent (40 acres), scrub/shrub (158 acres), and forested (220 acres). Other classified wetlands in Leota are excavated, semipermanently flooded unconsolidated bottom (0.47 acres), seasonally flooded emergent (4 acres), and impounded artificially/seasonally flooded scrub/shrub (24 acres). However, the bulk of palustrine wetlands in Leota are comprised of impounded artificially/semipermanently flooded emergent wetlands (808 acres) (USFWS, Brennan Basin 1999), which approximates the area in Leota units L-1 through L-10, including L-7A.

The eleven units within Leota Bottom provide an array of habitat gradients from pockets of deep to shallow open-water and areas of open-water interspersed with aquatic emergents. Cattail and hardstem bulrush are also the dominant plant species within these impoundments. Similar to Johnson Bottom the dominant species are not known, but other vegetation specific to the forested and scrub/shrub classifications include cottonwoods, willow species, Russian olive, Tamarix, squaw bush, greasewood, and sagebrush.

Of all the wetland sites on the Refuge, Leota has been the most intensively developed. Water sources for the Leota impoundments are the Green River and Pelican Lake. Green River water can either be pumped or gravity fed into the wetland complex through L-2. A new inlet structure and gauging station was constructed in 1997 to make gravity flow more feasible. Pelican Lake water can be gravity fed via pipeline into L-10. In March 1998, partial levee removal adjacent to L-7 and L-7A was accomplished and is designed to flood at River flows of 15,000 cfs and 20,000 cfs. A new drain structure/fish kettle located at the south end of the complex, was constructed in June 1999. These projects were constructed by the Bureau of Reclamation and funded by the Recovery Program and the Refuge Flood Relief Funds. Texas crossings or spillways were constructed in 1999 between L-1/L-2, L-2/L4, L1/L3, L4/L6, and L6/L8. The spillways relieve hydrologic pressure exerted on interior dikes and thus minimize water erosion.

## Wyasket Bottom

Of the 1,373 acres of inventoried wetlands that exist in Wyasket Bottom, 67 percent (924 acres) are lacustrine and 33 percent (449 acres) are palustrine. Relatively speaking, these acreages correspond to what has been managed as Wyasket Lake and Wyasket Pond within this bottom. Of the lacustrine wetlands, 39 acres are temporarily flooded, 868 acres are seasonally flooded, and 17 acres are semipermanently flooded. The temporarily and seasonally flooded lacustrine wetlands are further classified as impounded, artificially flooded, and unconsolidated shore, whereas the semipermanent lacustrine wetland is further classified as excavated and unconsolidated bottom. The classified palustrine wetlands are temporarily, seasonally, semipermanently, and artificially flooded. The temporarily flooded palustrine wetlands include scrub/shrub (175 acres), forested (151 acres), impounded artificially flooded emergent (17 acres), and emergent (2 acres). Additional classifications and modifiers of the seasonally flooded palustrine wetlands are impounded, artificially flooded unconsolidated shore (16 acres) and emergent (3 acres), emergent (5 acres), and unconsolidated shore (0.37 acres). The semipermanently flooded palustrine wetlands include the following additional classifications and modifiers, impounded, artificially flooded emergent (77 acres) and excavated, artificially flooded aquatic bed (3 acres) (USFWS, Brennan Basin, Ouray SE, and Ouray 1999).

When flooded, Wyasket Lake functions as a natural moist-soil unit producing an abundance of foods in the form of seeds and invertebrates for waterfowl, shorebirds, and other waterbirds. The predominant emergent plant species are dock and smartweeds, with some fringes of reed canarygrass. Sago pondweed is the dominant submergent vegetation in Wyasket Lake.

Wyasket Pond has a history of overabundant emergent vegetation. Cattail and hardstem bulrush are the dominant plant species covering almost the entire pond. The dominance of other species is not known, but other vegetation specific to the forested and scrub/shrub classifications in Wyasket Bottom include cottonwoods, Russian olive, Tamarix, squaw bush, greasewood, and sagebrush.

Wyasket Bottom is the least developed wetland site on the Refuge and floods naturally at a river flow of 18,000 cfs. Green River water can be diverted to Wyasket Pond via gravity flow inlet or pump station, although the pump station has not been used since 1991. This water can also be diverted to Wyasket Lake through the Wyasket Pond inlet structure, but careful consideration must be given to this practice. Diverting water to Wyasket Lake during the runoff period can set the stage for a mid-to-late summer drawdown, triggering an outbreak of avian botulism. Therefore, the Refuge staff has recently decided against actively diverting water to Wyasket Lake at River flows less than 18,000 cfs.

## Sheppard Bottom

All 967 acres of inventoried wetlands in Sheppard are temporarily, seasonally, and semipermanently flooded palustrine wetlands. Further modifiers and classification of temporarily flooded palustrine wetlands are forested (84 acres), scrub/shrub (78 acres), emergent (6 acres), and impounded, artificially flooded scrub/shrub (0.61 acres). Two acres of unconsolidated shore temporarily flooded wetlands exist in this Bottom. Additional classification of semipermanently flooded palustrine wetlands include excavated, artificially flooded emergent (770 acres), impounded, artificially flooded aquatic bed (20 acres), and emergent (7 acres) (USFWS, Ouray and Pelican Lake 1999).

During the NWI inventory of 1983, Sheppard Bottom units S-1 through S-5 were inundated and were thus classified as 770 acres of excavated palustrine, artificially/semipermanently flooded emergent wetlands. This may not reflect the area's average condition and illustrates the need to further refine, describe, and qualify data that was recorded in 1983 with what is generally present over time. Additionally, moist-soil units were created north and adjacent to Sheppard Bottom Unit 4 since the CIR photographs were taken in 1983. These moist-soil units (ca. 50 acres) would probably be classified as palustrine, unconsolidated bottom, artificially flooded, impounded wetlands. Furthermore, about 150 acres of farm fields or croplands are considered to lie within Sheppard Bottom. This classification with the potential farmed (f) modifier was not interpreted from the 1983 CIR photographs (see below for more information on moist-soil units and croplands).

Similar to Wyasket Pond, Sheppard Bottom units S-1 through S-5 become almost entirely covered with cattail and hardstem bulrush with the exception of a few scattered pockets of open water and encroachment of Tamarix. Other dominant species are not known, but other vegetation specific to the forested and scrub/shrub classifications in Sheppard Bottom include cottonwoods, Russian olive, Tamarix, and squaw bush. S-2, S-3, S-4, and S-5 were burned in 1999 to reduce emergent vegetation cover and to reduce fuel loads that could damage surrounding cottonwoods with potential wildfire.

Water for Sheppard Bottom is received from the Green River via a gravity flow inlet and pump station. Similar to all bottoms, inundation of Sheppard also occurs through "subup" or subsurface water movement caused by River flows. Correlation of specific River flows (e.g., cubic feet per second or cfs) with "subup" need to be determined for all of the Bottoms on the Refuge to facilitate better management decisions and planning. Water is also provided to Sheppard Bottom from Pelican Lake via gravity flow pipeline and seep/spring flows from Roadside Draw.

### North and South Roadside Draw

Water has not been impounded in this Draw since 1996 because of selenium concentrations that pose health risks (e.g., deformities, reduced reproduction, etc.) to wildlife. However, during the NWI inventory of 1983 the habitat in the North and South Roadside Draw was classified as impounded semipermanently flooded palustrine wetlands. Specifically, the North Draw has 36 acres of classified emergent and 0.38 acres of classified aquatic bed wetlands, while the South Draw has 7 acres of classified emergent and 6 acres of classified aquatic bed wetlands. The South Draw is bordered by 21 acres of temporarily flooded, emergent, palustrine wetlands (USFWS, Pelican Lake and Ouray 1999). Regardless of the classifications based on 1983 CIR photographs, remnants of the ponds exist but flows from the intermittent stream and natural spring seeps are no longer impeded.

Presently, reed canarygrass is the dominant plant species in the roadside Draw. Efforts have been made to establish cottonwoods by pole planting and have met with little success. Other vegetation present includes willow species, phragmites or common reed, Russian Olive, Tamarix, Russian knapweed, perennial pepperweed, cattail, and cocklebur.

Water in the Roadside Draw collects from irrigation overflow and springs or seeps containing high selenium concentrations. The Pelican Lake pipeline project was conceived in the early 1990's in an attempt to reduce the amount of contaminated water entering Refuge wetlands. Since no significant decrease occurred in contaminated water flow after the pipeline was constructed, the Roadside Ponds were retired from use in 1996. The Parker moist-soil management units were created in part in 1997 to offset these wetland losses.

### Moist-soil Units

The Parker Tract moist soil management units were constructed in March 1997. Five independently controlled impoundments exist, P-1 through P-5, that total 50 acres. Pelican Lake is the primary water source for these impoundments via gravity flow pipeline. Each unit has its own inlet, and outlets that connect with a drain canal that empties into S-1. Structures occur between units which allow for water to be diverted from unit to unit.

Green River water can also be diverted via the Sheppard inlet by backing this water into the units through the drain structures. This water should only be used as a last resort as it contains an extraordinary amount of salt cedar and perennial pepperweed seed during the runoff period, which readily germinates on exposed mud flats in mid-to-late summer.

The dominant vegetation in some of these units is alkali bulrush. Because of shallow water and the absence of common carp, this tract has the potential to produce an abundance of vegetative and invertebrate food for waterbirds. Production will be dictated by the ability to control or regulate salinity within these units, which may limit the germination of smartweeds, wild millets, and other preferred vegetation.



## Croplands

Croplands, or agriculture fields, comprise less than 1 percent (150 acres) of the total Refuge acreage. Agricultural activities such as plowing, disking, seeding, and irrigating are undertaken by a local landowner under a cooperative farming agreement. Crops are planted on a rotation basis and consist of alfalfa, small grains such as barley, and row crops such as grain sorghum or milo. Refuge croplands augment available forage for migratory birds, mule deer, elk, and other resident wildlife. Nearly 1,000 Canada geese and 2,000 mallards have been counted on these fields at any one time. Western meadowlark, red-winged blackbird, American goldfinch, horned lark, and savannah sparrow benefit from the croplands on the Refuge. Bald eagle, peregrine falcon, and golden eagle also use croplands either by preying directly on birds or feeding on bird carcasses.

For the near future, Refuge farm fields will be maintained to produce grain crops. Simply retiring the fields would create nonnative plant infestations unless careful revegetation planning is done. If new revegetation techniques are developed, a slow transition will be made toward establishing native seedbearing plants that will support migratory birds.

## Woods Bottom

Inventoried wetlands in Woods Bottom equal 478 acres. Eighty-six acres are classified as artificially/semipermanently flooded, aquatic bed lacustrine wetlands. The remaining 392 acres are classified palustrine wetlands. Specifically, 86 acres are temporarily flooded forested and 81 acres are scrub/shrub wetlands. Additionally, 19 acres are temporarily/artificially flooded emergent and 4 acres are scrub/shrub wetlands. The rest are seasonally/artificially flooded emergent (169 acres) and unconsolidated shore (33 acres) wetlands (USFWS, Ouray 1999).

The predominant emergent plant species are smartweeds and dock, with some fringes of reed canarygrass. Sago pondweed is the dominant submergent vegetation in Woods Main Pool and Backside Pool. The dominance of other species is not known, but other vegetation specific to the forested and scrub/shrub classifications in Woods Bottom include cottonwoods, Russian olive, Tamarix, and squaw bush.

Woods Bottom is the southernmost (downstream) wetland bottomland habitat on the Refuge. It is divided into two areas by an interior dike, creating a large main pool to the east. The western portion consists of some open water between fingers of high sand dunes. Green River water is delivered by gravity flow either through the inlet on the north side or the drain structure on the south side of the main pool. No permanent pumpsite exists for this location.

Woods Bottom was the first wetland bottomland site on Refuge to be enhanced/restored as nursery habitat to benefit native endangered fishes and is managed cooperatively with the Recovery Program. The drain structure was modified in 1993 with the construction of a fish kettle to facilitate handling and processing of fish. In the fall of 1997, levee removal occurred along the south side of the backside pool which allows for flooding at River flows of 13,000 cfs. Flooding occurs naturally into the main pool at flows of 14,000 cfs. More recently, Woods Bottom is also being operated for nonnative fish removal and has potential for growout of hatchery-produced wild-strain endangered fishes.

Riparian habitat decline along the Green River has been occurring since the construction of Flaming Gorge Dam (Hansen 1994, Laubhan 1997). Native riparian vegetation historically evolved with a dynamic hydrologic regime. Spring flooding and the deposition of fine textured soil is especially important to cottonwood phenology. Dam operations have eliminated historic spring flooding, sifted fine textured soils, and stabilized the water regime allowing nonnative plants to thrive and spread. Nonnatives that are displacing some of the native vegetation include perennial pepperweed or giant whitetop, tamarisk or saltcedar, Russian-olive, and some Russian knapweed. All of the nonnatives are scattered throughout this habitat and are mixed with other species except for tamarisk and pepperweed which has formed monotypic stands.

## Uplands

For the purposes of this document, uplands are defined as those areas that are neither riverine nor riparian. However, on the Refuge and from a management perspective, uplands are further divided into three categories; semidesert shrubland, grasslands, and clay bluffs. Uplands have received little attention and, therefore, habitat and wildlife information is lacking. The following discussions are in general terms. Acreage figures are estimates and may not be accurate.

### Semidesert Shrubland

Approximately 2,669 acres of semidesert shrubland cover the Refuge. Greasewood, rubber and low rabbitbrush, spiny hopsage, shadscale, fourwing saltbush, winterfat, big sagebrush, bud sagebrush, black sagebrush, Indian ricegrass, needle-and-thread, sand dropseed, and nonnative cheatgrass occur on this upland habitat type. This habitat also supports the state and federally threatened Uintah Basin hookless cactus. Semidesert shrubland habitat is scattered within the boundary of the Refuge but generally occurs in the transition zone between riparian areas and the clay bluffs.

### Grassland

Alkali sacaton, inland saltgrass, western wheatgrass, Great Basin wildrye, desert paintbrush, Nelson and scarlet globemallow can be found in the 1,520 acres of grassland that occur on the Refuge. This habitat, like semidesert shrublands, is scattered within the boundary of the Refuge, but generally occurs above the clay bluffs on what is locally referred to as a bench.

### Clay Bluffs

Little is known about the relative importance of the 1,935 acres of barren clay bluffs that occur on the Refuge. These clay bluffs make up part of the geological Morrison Formation formed during the Jurassic period of the Mesozoic era. Although this upland is practically devoid of vegetation on the surface, it is believed to be rich in dinosaur artifacts (Morris and Stubben 1994).

As previously stated, less is known about upland habitats on the Refuge. Before reasonable objectives for management of this habitat can be developed, a better understanding of the existing flora and fauna is needed. This must be accomplished through baseline biological inventories, determining the potential natural communities for uplands, gleaning information from other scientific sources as they become available, etc.

## Refuge Wildlife

Information on certain wildlife species and their needs is readily available while information on other species is sorely lacking. For example, a wealth of knowledge exists on waterfowl and production because previous Refuge management emphasis was placed on these species. Concerted efforts are underway to determine the needs of migratory songbirds, small mammals, reptiles and amphibians, and insects using baseline biological inventory techniques as mist-netting, point counts, and trapping. For the purposes of the CCP and particularly this section, the following discussion on wildlife is in general terms and by habitat. Other information included in the riparian habitat section involves a brief discussion on avian botulism in Wyasket Bottom. Because of the lack of specific information, discussion of wildlife is combined for semidesert shrubland and grassland in the upland section. Following the description on wildlife by habitat, a brief discussion is provided on special status species that occur or have occurred on the Refuge.

## Riverine

At different times of year, the Green River is a primary roost area for Canada and snow geese, mallard, gadwall, northern pintail, American wigeon, green-winged teal, and common merganser. Shorebirds such as greater and lesser yellowlegs, willet, and killdeer, benefit from the shallow water margins adjacent to riverbanks and sandbars. Mule deer, elk, moose, and black bear utilize the Green River as a watering source. Other mammals that are Green River or water obligate species include beaver and northern river otter. Several nonnative fish species exist in the River and likely displace the state and federally endangered bonytail, Colorado pikeminnow, humpback chub, and razorback sucker. Over 40 nonnative fish species have been introduced to the Colorado River System and of those, green sunfish, smallmouth bass, channel catfish, black bullhead, northern pike, fathead minnow, and red shiner have also become established in the Green River (B. Haines pers. comm).

As for many rivers of the western states, the Green River is the lifeblood of the semidesert ecosystem in which the Refuge lies. The River provides habitat for many species of wildlife, some of which are state and federally threatened or endangered. The Green River also serves as a landmark feature for many migratory bird species providing orientation during migration.

## Riparian

Representative bird and mammal species that depend on riparian areas for breeding include great blue heron, Canada goose, mallard, green-winged teal, mourning dove, yellow-billed cuckoo, great horned owl, Lewis' woodpecker, downy woodpecker, hairy woodpecker, northern flicker, western kingbird, black-capped chickadee, house wren, warbling vireo, yellow warbler, yellow-breasted chat, spotted towhee, northern oriole, beaver, northern river otter, porcupine, and meadow vole. Many other Refuge wildlife species are probably dependent on riparian habitats. Because previous management emphasis was placed on waterfowl and waterfowl production within these riparian habitats, other wildlife species and their life history requirements were overlooked. Local knowledge and studies conducted in similar areas have shown the significance of riparian habitats to a host of species (Chaney et al. 1990, Knopf et al. 1988).

The restoration/enhancement of riparian habitat, particularly wetland bottoms, may be a critical link to endangered fish recovery. These bottoms provide food and cover essential to the survival of larval razorback suckers during their "critical period" (i.e., survival from larval stage to juvenile stage) (Wydoski and Wick 1998). Although the importance of these habitats to endangered fish recovery is recognized, many bottoms are no longer connected to the River because of increased sediment deposits and reduced flows. In conjunction with the Bureau of Reclamation and the Recovery Program, efforts are underway to "restore natural flows" through these bottoms by removing or breaching containment levees along the River; particularly along Johnson, Leota, Woods, and portions of Sheppard Bottoms. These projects were initiated to restore native fish habitat, but will likely meet Refuge objectives by improving riparian and wetland habitat for migratory birds. The effects of levee removal on the biota in these areas is being carefully monitored and evaluated.

Wyasket Lake, the least altered unit on the Refuge, hosts thousands of waterfowl and hundreds of waterbirds. Even as the Lake benefits wildlife, it also poses a threat to wildlife. Because Wyasket Lake has been less modified, a more "natural" regime of periodic spring flooding, summer drawdown and dry up occur. This, coupled with biotic and abiotic factors, may be the cause of recent avian botulism outbreaks that have resulted in up to 1,000 waterbird deaths per year. Botulism is a naturally occurring bacteria of wetland soils that multiplies when water recedes, water and soil temperatures rise during summer, and plant material decomposes (Locke and Friend, 1987). Birds feeding in the area can pick up the bacteria, become ill, and die. Bird carcasses produce more bacteria, and other birds that feed on maggots on or near them become ill as well. Avian botulism outbreaks were documented in 1995, 1996, 1997, and 1999. It is probable that outbreaks occurred prior to 1995; however, they went undetected due to lack of staff on the ground to make these kinds of observations.

It is important to keep in mind that these riparian habitats serve many species of animals directly and indirectly. For example, birds of prey such as bald eagle, peregrine falcon, and great-horned owl reap the benefits of the smorgasbord (ducks, shorebirds, gulls) that utilize these wetlands. The wandering garter snake, Woodhouse's toad, boreal chorus frog, and northern leopard frog benefit from riparian habitats. Historically, some of these riparian habitats are believed to have provided important nursery habitats for the state and federally endangered razorback sucker. This is one of the major reasons additional riparian habitats are being restored through breaching levees in Woods, Leota and Johnson Bottoms. Riparian habitats serve as natural filters for our most precious resource, water, and enhance the area's aesthetics that people have come to enjoy. As water developments and diversions increase throughout the western United States, the riparian habitat that occurs on the Refuge will be of greater importance to existing plant and wildlife species that depend upon these riparian corridors.

## Uplands

### Semidesert Shrubland and Grassland

Animal species using this habitat for some or all of their life cycle include burrowing owl, short-eared owl, American kestrel, loggerhead shrike, sage thrasher, Brewer's sparrow, sage sparrow, Ord's kangaroo rat, black and white-tailed jackrabbit, desert cottontail, white-tailed antelope squirrel, mule deer, and pronghorn. Eastern fence lizard, short-horned lizard, side-blotched lizard, western whiptail, yellow-bellied racer, smooth green snake, and western rattlesnake make their permanent home in the semidesert shrubland of the Refuge.

### Clay Bluffs

Through casual observation and anecdotal evidence, it is known that the bluffs provide nesting areas for golden eagle and American kestrel, and provide perching sites for golden eagle, red-tailed hawk, ferruginous hawk, prairie falcon and peregrine falcon. Horned lark and western meadowlark can also be observed on the bluffs. The clay bluffs, caves, cracks, and crevices also provide wintering homes for the Great Basin gopher snake, short-horned lizard, and especially the western rattlesnake. The few small caves may serve as dens for mountain lions and other species yet to be confirmed as occurring on the Refuge, such as spotted, Townsend's big-eared, and Mexican free-tailed bats.

More emphasis needs to be placed on studying Refuge upland habitats to conserve the species dependent on them, to develop an appropriate management direction, and to understand the importance of this habitat within the UCRE.

## Special Status Species

A special status species is one that is either listed as endangered or threatened under the Endangered Species Act of 1973, or listed by State protective acts. Additionally, Utah lists species of management concern due to population declines, limited distribution range, or both. For purposes of this Plan, these are also considered special status species. The Refuge provides habitat for 26 special status species of wildlife and plants (see Table 2).

<b>Table 2. Special Status Species of Ouray National Wildlife Refuge<sup>1</sup></b>			
<b>SPECIES</b>	<b>STATUS<sup>2</sup></b>	<b>ABUNDANCE<sup>3</sup></b>	<b>PRIMARY REFUGE HABITAT USE</b>
<b>BIRDS</b>			
Bald Eagle	ST, FT	Rare Spring, Occasional Fall, Common Winter	Riparian Habitats & Wetlands/Bottomlands
Peregrine Falcon	SE	Rare Spring and Fall	Wetland/Bottomlands
Southwestern Willow Flycatcher	SE	Rare Summer	Riparian Habitats
Ferruginous Hawk	ST	Occasional Summer	Semidesert Shrubland
Yellow-billed Cuckoo	ST	Uncommon Summer	Riparian Habitats
Northern Goshawk	SP	Rare Winter	Riparian Habitats
Swainson's Hawk*	SP	Uncommon Spring, Summer, Fall	Grassland
Caspian Tern	SP	Rare Spring, Summer, Fall	Wetlands/Bottomlands
Black Tern	SP	Uncommon Spring, Fall, Common Summer	Wetlands/Bottomlands
Burrowing Owl*	SP	Uncommon Spring, Summer, Fall	Grassland
Short-eared Owl	SP	Uncommon Spring, Summer, Fall, Winter	Grassland
Common Yellowthroat	SP	Uncommon Spring, Summer, Fall	Wetlands/Bottomlands
American White Pelican	SD	Occasional Spring, Summer, Common Fall	Wetlands/Bottomlands
Osprey	SD	Rare Spring, Summer, Fall	Riverine & Riparian Habitats
Sage Grouse	SP/SD	Rare Spring, Summer, Fall, Winter	Semidesert Shrubland
Long-billed Curlew*	SP/SD	Rare Spring, Summer, Fall	Grassland & Wetlands/Bottomlands
Lewis' Woodpecker	SP/SD	Common Spring, Summer, Uncommon Fall	Riparian Habitats
Blue Grosbeak	SP/SD	Uncommon Spring, Summer, Fall	Riparian Habitats & Wetlands Bottomlands
<b>MAMMALS</b>			
Northern River Otter	SP/SD	Uncommon resident with sightings increasing	Riverine & Wetlands/Bottomlands
Lynx	SP/SD	Rare, Observed only once on Refuge	
<b>FISH</b>			
Bonytail	SE,FE	No wild bonytail caught in several years	Riverine
Colorado Pikeminnow	SE,FE	Ouray reach is an important nursery habitat area	Riverine & Wetlands/Bottomlands
Humpback Chub	SE,FE	Severely reduced in numbers	Riverine
Razorback Sucker	SE,FE	Green River only known spawning areas, Severely reduced in numbers	Riverine & Wetlands/Bottomlands
Roundtail Chub	ST	Reduced in numbers and distribution	Riverine
<b>REPTILES</b>			
Smooth Green Snake	SP/SD	Uncommon, Distribution is unclear	Wetlands/Bottomlands
<b>PLANTS</b>			
Uintah Basin Hookless Cactus	ST,FT	Common	Dry gravel terraces

<sup>1</sup>Source: Utah Division of Wildlife Resources. 1998. Utah Sensitive Species List.

<sup>2</sup>SE= State Endangered, ST= State Threatened, FE= Federally Endangered, FT= Federally Threatened, SP= Special concern because of decrease in population, distribution, and/or habitat availability, SD= Special concern because requires specific habitat that is limited or restricted, SP/SD= Special concern due to both a declining population and limited range.

<sup>3</sup>Common= likely to be seen in suitable habitat, Uncommon= present, but not certain to be seen, Occasional= seen only a few times during a season, Rare= seen at intervals of 2 to 5 years.

Spring= March-May, Summer= June-August, Fall= September-November, Winter= December-February.

\*Indicates that bird is a confirmed nester on Refuge.

## Threatened and Endangered

Federally endangered or threatened species that occur or have occurred on the Refuge include the bald eagle, bonytail, Colorado pikeminnow, humpback chub, razorback sucker, and Uintah Basin hookless cactus. State listed species and species of management concern include peregrine falcon, southwestern willow flycatcher, ferruginous hawk, yellow-billed cuckoo, and roundtail chub. Seven of these species are regularly encountered on the Refuge throughout different seasons of the year. Sightings of the peregrine falcons on the Refuge are increasing. During spring and fall, peregrines can often be observed hunting for waterbirds over wetlands and bottomlands. Bald eagles have become a common sight particularly during fall and winter when upwards of 30 individuals have been observed in one day. Eagles watch for prey from large standing cottonwood trees along the River's edge or along some of the bottomlands. Another relative of the falcon and eagle, the ferruginous hawk, can be seen occasionally hunting over the expanse of the semidesert shrubland on the Refuge during summer.

The federally endangered Colorado pikeminnow and razorback sucker and the state threatened roundtail chub can be found within the Refuge's stretch of the Green River. Ouray National Fish Hatchery is augmenting the extant populations of these fish that occur on the Refuge and adjacent to the Refuge. Additionally, efforts are being coordinated through the Recovery Program and other agencies to mimic natural river-flows that may aid in the recovery of these species that are on the brink of extinction.

Surveys conducted in 1997 revealed that the Uintah Basin hookless cactus is more common on the Refuge than once believed. A survey undertaken in 1988 revealed the existence of 1,260 individual plants, while a count in 1997 led to the discovery of an additional 846 plants; bringing the known total of the Uintah Basin hookless cactus on the Refuge to 2,106 individuals. This cactus is typically found towards the top of gravel covered terraces. The Refuge has the potential to serve as a good learning ground on the biology of this species as this habitat is not presently manipulated for habitat management in any manner.

## Species of Management Concern

Species of management concern (Table 2), whether because of population declines, limited distribution range, or both that occur or have occurred on the Refuge include northern goshawk, Swainson's hawk, Caspian tern, black tern, burrowing owl, short-eared owl, common yellowthroat, American white pelican, osprey, sage grouse, long-billed curlew, Lewis' woodpecker, blue grosbeak, northern river otter, and smooth green snake. Black tern, American white pelican, and Lewis' woodpecker are commonly observed on the Refuge. Although listed as uncommon, northern river otter and smooth green snake observations on the Refuge are increasing. Swainson's hawk, burrowing owl, long-billed curlew, and Lewis' woodpecker have been confirmed as nesting on the Refuge.

Some of these species make use of the Refuge for only a brief period. However brief the stay may be, the Refuge provides a vital haven for feeding, resting, and loafing which cannot be found for many miles around.

## Public Use

No accurate counts of Refuge visitors have been kept, but current estimates are 10,000 visitors per year. Visitation includes school tours and programs, teacher workshops, senior citizen tours, boy scouts, and hunters and anglers. Most public use occurs from April through November.

Wildlife observation is the major public use activity on the Refuge. The Refuge's 12-mile auto tour route is enjoyed by many throughout the year. From spring wild flowers and broods of ducklings to large numbers of mule deer in the fall and winter, viewers are drawn from the local communities and throughout the area. Bird watching is rapidly becoming a popular activity on the Refuge.

Hunting and fishing are also popular. The opportunity to harvest mule deer, waterfowl, and ring-necked pheasants attracts hunters from across Utah. The public may hunt for deer, waterfowl and pheasant in Leota Bottom and for deer and pheasant in Johnson and Wyasket Bottoms. Fishing is allowed only on the Green River. Fishing for channel catfish is a popular activity among many local residents. State prescribed seasons and hunting regulations apply on the Refuge.

Additional wildlife-dependent public uses include wildlife photography, interpretation and environmental education. Compatible activities that support some or all of these uses also include canoeing and rafting on the Green River, sightseeing, bicycling and horseback riding on designated roads, and hiking.

Current public use facilities include an informational kiosk with a nearby picnic table and outhouses, an auto tour route with observation tower, a visitor center, and parking areas for hunters, anglers, observers and photographers (see Map 8). The kiosk contains general Refuge information, a changeable panel, a cork board for posting hunting regulations, fishing regulations, and Refuge hours, and leaflet dispensers. The tour route displays and information leaflet need updating to reflect changes in the landscape and management practices. Some informational and directional signs on the Refuge have recently been updated.

## Refuge Cultural and Paleontological Resources










Limited cultural resource studies have been conducted on lands included in the Refuge. Information on the cultural history of the Uintah Basin is sketchy and difficult to compile. Much of the Refuge was disturbed many years ago during construction of dikes, levees, and roads so few intact sites remain to be surveyed. In recent years, seven project-specific cultural and paleontological resource surveys and inventories were conducted in Brennan Basin, the Ouray L-9/10 borrow site, for a powerline for Ouray NWR, the Pelican Lake Pipeline, and the Ouray National Fish Hatchery and water pipeline sites. Five prehistoric sites (one of which may be the site previously identified) and four isolated finds of prehistoric material (mostly lithic acquisition materials) were located. Reports of these surveys are on file at the Refuge office. In 1998, three projects sites for Leota Bottom levee and spillway construction were surveyed with no materials found. A thorough inventory of potential cultural and paleontological resource sites is needed for the majority of Refuge lands. Other than an interpretive sign on Leota Bluff describing explorations by John Wesley Powell, no cultural or paleontology exhibits or materials have been developed for the Refuge.

The earliest archaeological work done in the Refuge vicinity was by John Wesley Powell in 1869 and 1871. No prehistoric sites were reported by Powell from his explorations along the Green River through the Refuge.



# Ouray National Wildlife Refuge Public Use Map

## LEGEND

-  Tribal Hunting Only
-  Deer and Pheasant Hunting
-  Waterfowl, Deer and Pheasant Hunting
-  No Hunting Zone
-  Private Lands
-  Closed Area
-  Ouray NWR Boundary
-  Auto Tour Route
-  Parking

Map Location

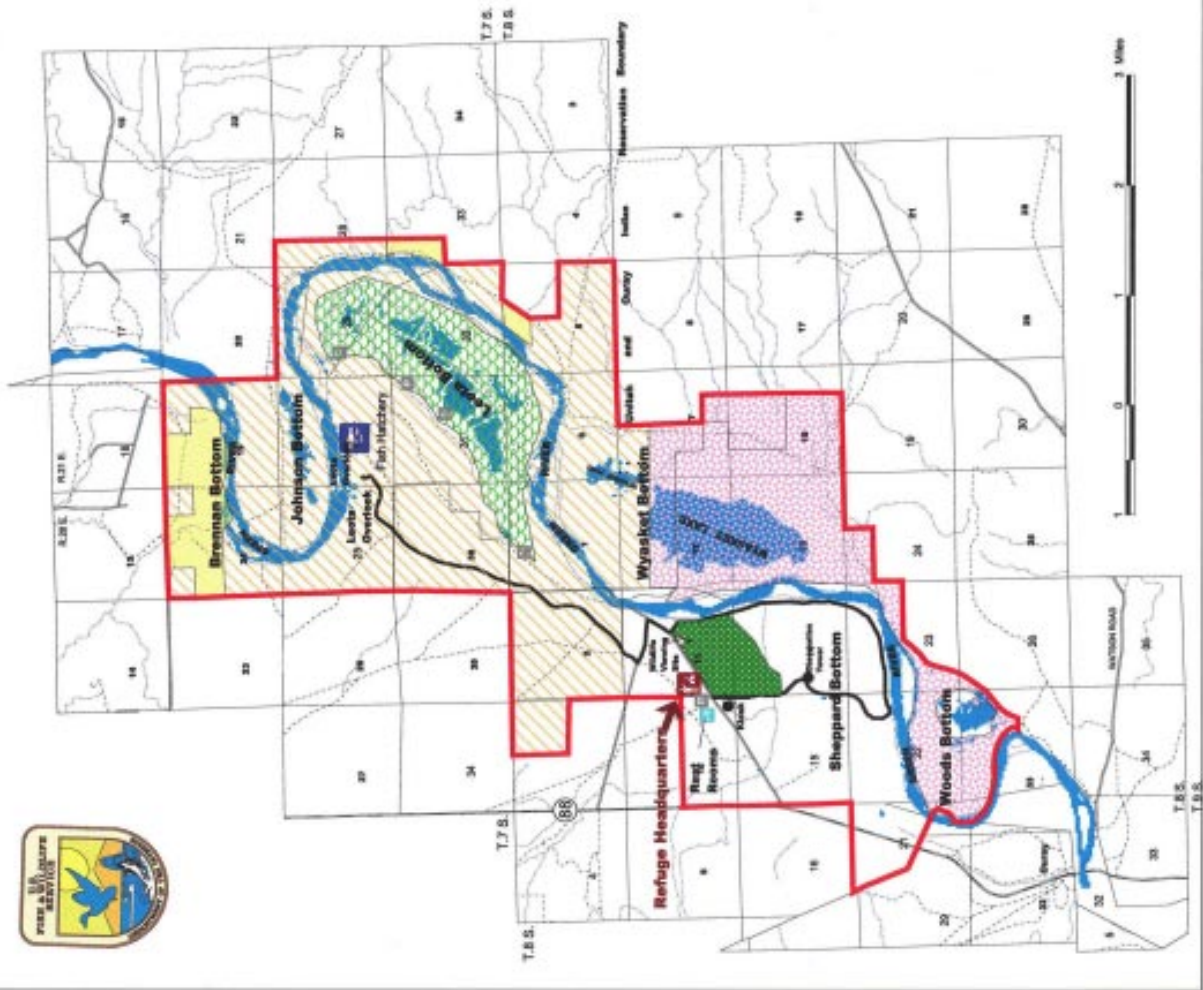


State of Utah



Map # 8

*DRAFT*





In the early 1940's, Harvard University collected a large sample of fossil mammal specimens dating to the Late Eocene (38 to 56 million years ago) Uinta Formation from a site they called Leota Quarry. It has been determined that this site falls within the boundaries of Ouray NWR. The University of Utah Department of Anthropology conducted a survey of the proposed Refuge in 1961. One surface site on the bank of the Green River in Leota Bottom and scattered artifacts on the River terraces were identified. They determined that it was not necessary to salvage the little prehistorical material on Refuge lands. In 1978, the Smithsonian Institute also conducted a paleontological study on this site. Several skulls of small sheep-like artiodactyls were found. Judging from the quantity as well as the quality of specimens, they felt additional collecting is definitely warranted, but none has been done to date.

## Refuge Land Acquisition

The present acreage of the Ouray NWR totals 11,987. This Refuge acreage is made up of 2,692 acres of leased Ute Tribal lands, 1,153 acres of land leased from the State of Utah, 3,110 acres transferred from the BLM, and 5,032 acres of land purchased in fee title. The Executive Order boundary of the Refuge includes 13,984 acres (see executive order boundary map). It is the desire of the U.S. Fish and Wildlife Service to purchase all lands within the Executive Order boundary, including all leased lands, when they become available and/or from willing sellers.

The Recovery Program is actively pursuing acquisition and enhancement of floodplain habitats through wildlife easements along the Green, Upper Colorado, and Gunnison Rivers (see Appendix J. for description and Environmental Assessment). Easements on the Green River will become part of the Refuge System and will be monitored and enforced by the Refuge staff.

## Special Management Areas

To be proposed for Wilderness designation, an area must contain at least 5,000 contiguous, roadless acres. No Refuge lands meet this criteria, so no Wilderness designation is being pursued. The Green River in the region of Ouray NWR is not currently being considered for Wild and Scenic River designation as it does not meet 2 basic designation criteria. The River is not free flowing, and the majority is altered by protective levees and diking.

## Refuge Fire Management

Fire management on the Ouray NWR presently consists of prescribed fire, hazardous fuels reduction, and wildfire suppression preparedness. The Refuge is a partner in the Uintah Basin Interagency Fire Center in Vernal, for wildland and prescribed fire activities. Prescribed fire at Ouray has been primarily used as a vegetation management tool in wetlands to control cattail and other emergent vegetation. Fire was also used experimentally to control nonnative plants such as perennial pepperweed in upland areas with mixed results. The challenge in utilizing prescribed fire to manage Refuge wetlands comes in preventing the spread of the fire into neighboring cottonwood and willow stands which results in injury or mortality of many trees. Fire damage and windthrow have contributed to the degradation of the Refuge's riparian corridor. Prescribed burning of wetlands adjacent to the riparian corridor is an appropriate tool used to manage this ecotype as fire is a naturally occurring event for these plant communities. The use of fire requires a thorough understanding of fire behavior and use of wide fire breaks to protect sensitive habitats. A more thorough analysis of prescribed fire and benefits to specific Refuge habitats needs to be completed and addressed in the Fire Management Plan to properly use this tool to achieve habitat management objectives.

## Water Rights

Utah's Water Appropriation System requires permits for surface water and groundwater use, under general administrative supervision of the State Engineer, Department of Natural Resources, Division of Water Rights. A water right is appurtenant to the land, but may be severed, transferred, exchanged, or sold. Any change in point of diversion, type of use, amount, or season of use requires approval of the State Engineer. All surface and groundwater uses are regulated. In times of shortage, domestic use has priority over all other uses, regardless of priority date. Forfeiture occurs when a water right has not been used for five years. Abandonment occurs when the owner's *intent* to abandon is proven without regard to nonuse.

Currently, the Refuge holds state water rights sufficient to manage wetlands and marshes to meet its goals. For descriptions and details on these rights refer to Appendix L.

## GIS Mapping Data Needs

Presently, GIS capabilities on Ouray include ArcView 3.0 and a Trimble GeoExplorer. In the future, periodic upgrades or additions in hardware (e.g., computer, monitor, plotter, etc.) and software (e.g., ArcView 3.2 or ArcInfo) may be required. Maps that are available include digital raster graphs (DRGs), NWIs, and other data (prescribed burn areas, trap locations, impoundment areas, etc.) collected locally by Refuge staff. Other GIS data desired for management planning, include digital orthophoto quads (DOQs), videography, replication of NWI during an average flow year, vegetation mapping to complement habitat mapping, etc. Because gaps exist in electronic mapping databases for the Uintah Basin, compiling and sharing existing data will be possible through partnerships with other agencies, universities, and on-site mapping.

# ***Management Direction***

## Refuge Goals, Objectives, and Strategies

### Refuge Goals

The following goals are derived from the Refuge System mission, Refuge purpose, other Service landscape and species plans, and from the management issues discussion in the preceding pages of this Plan.

- A. Restore and enhance riparian and wetland habitats for migratory birds that depend upon the Green River corridor.
- B. Provide habitats that support the recovery of federally listed and Utah state special status species on or adjacent to the Refuge.
- C. Maintain healthy grassland and semidesert shrubland habitats for wildlife.
- D. Minimize wildlife exposure to environmental contaminants on or adjacent to the Refuge.
- E. Provide opportunities for compatible wildlife-dependent recreation.
- F. Increase awareness of the Refuge and the role of the Refuge in fisheries and wildlife management, the National Wildlife Refuge System, and the UCRE for visitors and local communities through environmental education, interpretation, and compatible recreation.
- G. Provide protection for cultural and paleontological resources on the Refuge and educate visitors about these sites.

### Refuge Objectives and Strategies

#### **P Goal A: Restore and enhance riparian and wetland habitats for migratory birds that depend upon the Green River corridor.**

Habitats that occurred historically along the Green River were used by an array of bird species migrating through the arid west between wintering and breeding areas. Human related activities altered the characteristics of River flows, and subsequently, plant communities sustained by the River have been drastically altered. Migratory birds and other wildlife-dependent on the River ecosystem have declined as a result. The Refuge will work to enhance the quality of riparian and wetland habitats to protect this vital migration corridor.

Six well defined bottoms or naturally occurring floodplain depressions exist within the Refuge. They contain the riparian and wetland habitats so vital for migratory birds and native fishes. Each bottom differs in its infrastructure, floodability and plant community, requiring differing management actions to promote restoration and enhancement.

Baseline plant and animal biological data for the Refuge is very limited. The collection of these data will be the starting point towards accomplishing this goal. Wildlife inventories and vegetation mapping will be initiated for each bottom. Funds are currently available for this bio-monitoring through FY2000 Refuge Operations Needs (\$230k over 3 years). A description of how riparian and wetland objectives will be carried out on each bottom are identified as strategies.

**Objective 1. Improve structure and composition of woody and herbaceous riparian communities to provide nesting, feeding, loafing, and resting habitat for migratory birds.**

Some of the migratory songbird species which may benefit from the proposed management actions include Lewis' woodpecker yellow-billed cuckoo, western kingbird, black-capped chickadee, warbling vireo, yellow warbler, yellow-breasted chat, spotted towhee, and northern oriole. Once baseline information is collected, as proposed within the following strategies, a detailed Habitat Management Plan identifying each species habitat needs will be prepared.

Strategy: Investigate each bottom's vegetative climax potential, floodability, and potential contribution to its host of wildlife species.

Strategy: Recreate the 1983 NWI inventory and wetland classification survey for average water conditions.

**Brennan Bottom**

**Strategies:**

- ✓ Collect baseline fauna and flora inventories and map vegetation by 2003.
- ✓ Evaluate Brennan's floodability and assess its potential climax condition under the new Flaming Gorge regulated flow releases.
- ✓ Reduce nonnative plants by 75 percent within 15 years, using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. Current cursory estimates of nonnative vegetation which exist within Brennan are: whitetop 20 percent, Russian olive 1 percent.
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five-year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Ensure oil and gas extraction activities do not negatively affect desired habitat responses.
- ✓ Investigate private inholding acquisition of sensitive riparian habitats from willing sellers.
- ✓ Repair, post, and maintain four miles of fence to prevent livestock trespass.

**Johnson Bottom**

**Strategies:**

- ✓ Collect baseline fauna and flora inventories and map vegetation by 2003.
- ✓ Evaluate Johnson's floodability and assess its potential climax condition under the new Flaming Gorge regulated flow releases.
- ✓ Evaluate vegetative response to depth, timing, duration, and frequency of flooding.
- ✓ Reduce nonnative plants by 75 percent within 15 years, using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. Current cursory estimates of nonnative vegetation which exist within Johnson are: saltcedar 30 percent, whitetop 20 percent, Russian olive 1 percent.
- ✓ Remove three interior crossdikes to restore functional hydrology, facilitate draining, recovery of endangered fish, and the removal of nonnative fish.
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Maintain two miles of fence to prevent livestock trespass.

## Leota Bottom

### Strategies:

- ✓ Collect baseline fauna and flora inventories and map vegetation by 2003.
- ✓ Evaluate Leota's floodability and assess its potential climax condition under the new Flaming Gorge regulated flow releases.
- ✓ Evaluate vegetative response to depth, timing, duration, and frequency of flooding.
- ✓ Evaluate removal of L1,3,5,7 and 7a dikes to promote restoration and enhancement of the riparian habitat for all dependant species.
- ✓ Reduce nonnative plants by 75 percent within 15 years, using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. Current cursory estimate of nonnative vegetation which exist within Leota are: saltcedar 20 percent, whitetop 10 percent, Russian knapweed 1 percent, Russian olive 5 percent.
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Document, collect, and dispose of birds affected by botulism outbreaks.

## Wyasket Bottom

### Strategies:

- ✓ Collect baseline fauna and flora inventories and map vegetation by 2003.
- ✓ Evaluate Wyasket's floodability and assess its potential climax condition under the new Flaming Gorge regulated flow releases.
- ✓ Evaluate vegetative response to depth, timing, duration, and frequency of flooding.
- ✓ Evaluate removal of Wyasket Pond dike to promote restoration and enhancement of the riparian habitat for all dependant species.
- ✓ Reduce nonnative plants by 75 percent within 15 years, using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. Current cursory estimate of nonnative vegetation which exist within Wyasket are: saltcedar 20 percent, whitetop 10 percent, Russian knapweed 1 percent, Russian olive 5 percent.
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five ear intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Maintain seven miles of fence to prevent livestock trespass.

## Sheppard Bottom

### Strategies:

- ✓ Collect baseline fauna and flora inventories and map vegetation by 2003.
- ✓ Evaluate Sheppard's floodability and assess its potential climax condition under the new Flaming Gorge regulated flow releases.
- ✓ Evaluate vegetative response to depth, timing, duration, and frequency of flooding.
- ✓ Maintain 0.5 miles of fence to prohibit livestock trespass.
- ✓ Reduce nonnative plants by 75 percent within 15 years, using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. Current cursory estimates of nonnative vegetation which exist within Sheppard are: saltcedar 25 percent, whitetop 30 percent, Russian knapweed 1 percent, Russian olive 5 percent.
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Remove a portion of S-3 protective dike and all of the S-3/S-5 dike to allow flushing of selenium and reestablishment of riparian habitat.
- ✓ Reduce hazardous fuel loads in a 5-acre site south of S-3 to prevent potential wildfire damage.

## Woods Bottom

### Strategies:

- ✓ Collect baseline fauna and flora inventories and map vegetation by 2003.
- ✓ Evaluate Wood's floodability and assess its potential climax condition under the new Flaming Gorge regulated flow releases.
- ✓ Evaluate vegetative response to depth, timing, duration, and frequency of flooding.
- ✓ Maintain two miles of fence to prohibit livestock trespass.
- ✓ Reduce nonnative plants by 75 percent within 15 years, using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. Current cursory estimates of nonnative vegetation which exist within Sheppard are: saltcedar 20 percent, whitetop 20 percent, Russian olive 5 percent.
- ✓ Evaluate removal of the center dike to improve its hydrologic flow and riparian habitat.
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Continue coordination of water management with the Recovery Program to facilitate riparian habitat improvements and the recovery of endangered fish.



**Objective 2. Improve structure and composition of submergent and emergent wetland communities to provide nesting, feeding, loafing, and resting habitat for migratory birds.**

This Comprehensive Conservation Plan de-emphasizes the production of waterfowl, but by no means will it ignore this habitat use. Many species of waterbirds utilize the Refuge's man-made and natural wetlands for nesting, loafing, feeding, and migrational stopover habitat. Although the Refuge proposes to restore many areas back to riparian woodland habitat some areas do not readily lend themselves to this conversion and are better managed as natural and/or man-made wetlands.

Refuge wetlands will be managed under a wet/dry rotational scheme which will provide the greatest diversity of habitat and food for migratory waterbirds. At present, many of the Refuge's water management facilities (headgates, stoplog structures, inlet structures and outlet structures) are in a state of disrepair and needed repairs are identified as strategies. A need also exists to collect information on the sub-up potential (river flow-influenced groundwater which rises to the surface within each wetland) of each unit.

Some of the habitat conditions which will be sought are: varying water depths, and a mosaic of varying vegetative structure and composition. At any one time, some wetlands will remain dry, some will contain less than 50 percent vegetative cover, and some will contain more. Wetland units will be managed so that a cycle of dry, shallow water, deep water, sparse vegetation, and dense vegetation is maintained over time. The types of food or protective cover will differ under each condition, but in any one year, a broader variety of conditions will exist. This will provide essential habitats for migratory waterbirds during spring and fall migration. Because of the dynamic nature of the arid Uintah Basin, in some years, enough water will not be available to produce the desired ratio. Under depressed water years, the Refuge will provide habitat which is most conducive to those conditions. Individual bottoms (excepting the Parker Tract) will be managed as a single unit, not as a collection of separate internal impoundments. For example, Sheppard Bottom contains five impoundments. These will be manipulated to contribute to the quality of the Bottom as a whole. In any case, internal impoundments cannot realistically be managed separately because of subsurface water seepage and other water control constraints.

Monthly avian surveys will be conducted on all wetlands to provide managers with the information necessary to enhance or maintain the area. Baseline biological inventories of vegetation and wildlife will be conducted for each wetland. Refuge Operation Needs funds totaling \$230,000 are available to complete this project over the next three years.

Some of the known migratory bird species that utilize Refuge wetland habitats include northern harrier, white-faced ibis, eared, western and pied-billed grebes, dabbling and diving ducks, great blue heron, American bittern, red-winged and yellow-headed blackbirds, marsh wren, black-crowned night heron, and many shorebirds. Many of these birds also use the Green River.

**Strategy: Recreate the 1983 NWI inventory and wetland classification survey for average water conditions.**

## Johnson Bottom

### Strategies:

- ✓ Evaluate Johnson's wetland potential to provide a more diverse emergent/submergent/open water wetland mosaic under varying water availability.
- ✓ Collect baseline inventory fauna and flora inventories and map vegetation by 2003.
- ✓ Assess each wetland impoundment sub-up potential for management purposes (at what cfs does the river flow for sub-up to occur).
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Evaluate use of fire, drying, disking, mowing, and root plowing to maintain open water.
- ✓ Coordinate with the Recovery Program on proposed habitat management actions (flooding, draining, mosquito abatement, integrated pest management, etc.) to ensure that fish recovery objectives are not negatively impacted.
- ✓ Reduce nonnative plants by 75 percent within 15 years using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. A current cursory estimate of nonnative vegetation which exists within Johnson's wetlands is: saltcedar 10 percent, whitetop 10 percent, Russian olive 2 percent.
- ✓ Protect great blue heron rookery site from prescribed and wild fires.
- ✓ Pursue funds for reconstructing Johnson's inlet structure.
- ✓ Remove all interior dikes to encourage a more natural hydrologic flood and drawdown regime.

## Leota Bottom

### Strategies:

- ✓ Evaluate Leota's wetland potential to provide a more diverse emergent/submergent/open water wetland mosaic under varying water availability.
- ✓ Collect baseline inventory fauna and flora inventories and map vegetation by 2003.
- ✓ Assess each wetland impoundment sub-up potential for management purposes (at what cfs does the river flow for sub-up to occur).
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Evaluate use of fire, drying, disking, mowing, and root plowing to maintain open water.
- ✓ Coordinate with the Recovery Program on proposed habitat management actions (flooding, draining, mosquito abatement, integrated pest management, etc.) to ensure that fish recovery objectives are not negatively impacted.
- ✓ Reduce nonnative plants by 75 percent within 15 years using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. A current cursory estimate of nonnative vegetation which exists within Leota's wetlands is: saltcedar 10 percent, whitetop 20 percent, Russian olive 2 percent, Russian knapweed 1 percent.
- ✓ Remove existing unproductive nesting islands and form 2 to 3 larger islands with improved design and rehabilitated cover within L10.
- ✓ Replace all degraded water control structures on interior diked units.
- ✓ Evaluate removal of L1,3,5,7 and 7a dikes and its effect on the Leota wetland complex.
- ✓ Document, collect, and dispose of birds affected by botulism outbreaks.
- ✓ Raise L-9/L-10 dike 18-24 inches to improve open water to emergent vegetation ratio.
- ✓ Evaluate the function and efficiency of 6 new spillways.
- ✓ In conjunction with Ouray National Fish Hatchery, improve management of hatchery effluent discharge.

## Wyasket Bottom

### Strategies:

- ✓ Evaluate Wyasket's wetland potential to provide a more diverse emergent/submergent/open water wetland mosaic under varying water availability.
- ✓ Collect baseline inventory fauna and flora inventories and map vegetation by 2003.
- ✓ Assess each wetland impoundment sub-up potential for management purposes (at what cfs does the river flow for sub-up to occur).
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Evaluate use of fire, drying, discing, mowing, and root plowing to maintain open water.
- ✓ Coordinate with the Recovery Program on proposed habitat management actions (flooding, draining, mosquito abatement, integrated pest management, etc.) to ensure that fish recovery objectives are not negatively impacted.
- ✓ Reduce nonnative plants by 75 percent within 15 years using biological, mechanical, and chemical methods, which may include burning and reseedling.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. A current cursory estimate of nonnative vegetation which exists within Wyasket's wetlands is: saltcedar 20 percent, whitetop 20 percent, Russian olive 3 percent, Russian knapweed 1 percent.
- ✓ Document, collect, and dispose of birds affected by botulism outbreaks.
- ✓ Determine the need to flood Wyasket Pond on a year-by-year basis to provide migration and nesting habitat for Virginia rail, sora, and American bittern.
- ✓ Reestablish floodwater flow through Wyasket Pond into Wyasket Lake by either levee removal or construction of new spillways.
- ✓ Evaluate removal of the entire Wyasket Pond dike to reestablish hydrologic flow and improve overall wetland habitat.

## Parker Tract

### Strategies:

- ✓ Control nonnative plants using biological, mechanical, and chemical means.
- ✓ Flood units with Pelican Lake pipeline water only, as water from the Green River carries whitetop and saltcedar seed. If Pelican Lake water is not available, leave the units dry.
- ✓ Leave at least one unit dry by rotation each year and document the effects to vegetation and invertebrate production.
- ✓ Create a management model using Moist Soil Advisor software.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.

## Sheppard Bottom

### Strategies:

- ✓ Evaluate Sheppard's wetland potential to provide a more diverse emergent/submergent/open water wetland mosaic under varying water availability.
- ✓ Collect baseline inventory fauna and flora inventories and map vegetation by 2003.
- ✓ Assess each wetland impoundment sub-up potential for management purposes (at what cfs does the river flow for sub-up to occur).
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Evaluate use of fire, drying, discing, mowing, and root plowing to maintain open water.
- ✓ Coordinate with the Recovery Program on proposed habitat management actions (flooding, draining, mosquito abatement, integrated pest management, etc.) to ensure that fish recovery objectives are not negatively impacted.
- ✓ Reduce nonnative plants by 75 percent within 15 years using biological, mechanical, and chemical methods, which may include burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. A current cursory estimate of nonnative vegetation which exists within Sheppard's wetlands is: saltcedar 10 percent, whitetop 20 percent, Russian olive 5 percent.
- ✓ Pursue funds to replace all water control structures within Sheppard allowing necessary water management to provide the preferred wetland habitat.

## Woods Bottom

### Strategies:

- ✓ Evaluate Wood's wetland potential to provide a more diverse emergent/submergent/open water wetland mosaic under varying water availability.
- ✓ Collect baseline inventory fauna and flora inventories and map vegetation by 2003.
- ✓ Assess each wetland impoundment sub-up potential for management purposes (at what cfs does the river flow for sub-up to occur).
- ✓ Conduct aerial photography, with the assistance of the Bureau of Reclamation, at five year intervals to gauge vegetative responses caused by new management techniques.
- ✓ Replicate National Wetland Inventory (NWI) under average, post-dam Green River Flow Conditions.
- ✓ Evaluate use of fire, drying, discing, mowing, and root plowing to maintain open water.
- ✓ Coordinate with the Recovery Program on proposed habitat management actions (flooding, draining, mosquito abatement, integrated pest management, etc.) to ensure that fish recovery objectives are not negatively impacted.
- ✓ Reduce nonnative plants by 75 percent within 15 years using biological, mechanical, and chemical methods, which may include and burning and reseeding.
- ✓ Accurately map and quantify existing coverages of nonnative vegetation using GIS and field groundtruthing. A current cursory estimate of nonnative vegetation which exists within Wood's wetlands is: saltcedar 20 percent, whitetop 20 percent, Russian olive 3 percent, Russian knapweed 1 percent.
- ✓ Remove interior levee to reestablish a more natural flood and drawdown regime.

■ **Goal B: Provide habitats that support the recovery of federally listed and Utah State special status species on or adjacent to the Refuge.**

The needs of threatened and endangered migratory birds and fish that use the Refuge will be provided for by habitat goals such as riparian woodland and wetland enhancement and restoration. Enhancing and restoring wetland and riparian habitats will be conducted to improve food, and cover requirements for bald eagle, peregrine falcon, osprey, razorback sucker, and Colorado pikeminnow in accordance with documented literature.

Providing for this multitude of species is indeed a delicate balancing act. In most cases the proposed management actions can be conducted in such a way that these species can all be taken into consideration. Managing for multiple species will be most feasible in those areas selected to be managed under mimicked natural conditions.

**Objective 1. Provide habitats that support the recovery of Colorado River endangered fishes (razorback sucker, Colorado pikeminnow, humpback chub).**

The Refuge is currently supporting recent levee removal projects within the Refuge. Much data remains to be gathered and analyzed to show the effectiveness of levee removal and the utilization of these sites by endangered fish. The Colorado River Recovery Program continues to investigate and research other alternatives which may be conducive towards recovering endangered fish.

Strategies:

- ✓ Provide site and operations support for the Ouray National Fish Hatchery and associated research efforts.
- ✓ Participate in the Recovery Program's levee removal project in Leota Bottom, Johnson Bottom, and Woods Bottom. (For additional information please refer to the Environmental Assessment titled "Levee Removal Project of the Floodplain Habitat Restoration Program" dated February, 1997, Appendix K)
- ✓ Provide staff support for enforcement and monitoring of select wildlife easements acquired to restore and preserve endangered fish habitat. (For additional information please refer to the Environmental Assessment titled "Acquisition and Enhancement of Floodplain Habitats" dated May, 1998)
- ✓ Assist the Recovery Program with removal of nonnative fish in Woods, Leota, and Johnson bottoms

**Objective 2: Maintain populations of the Uintah Basin hookless cactus.**

The Refuge's role in recovering the Uintah Basin hookless cactus is primarily one of caretaker. Management for this species consist of mapping locations and avoiding disturbances to known stands.

Strategies:

- ✓ Conduct field surveys at four year intervals to locate any new stands of cactus and to assess the condition of existent stands.
- ✓ Identify new potential, suitable sites and avoid disturbance of the area.

■ **Goal C: Maintain healthy grassland (Indian rice grass, shadscale etc.) and semidesert shrubland habitats for wildlife.**

**Objective: Investigate whether management techniques exist that can insure the health of cold desert grasslands.**

Strategies:

- ✓ Measure extent of nonnative vegetation, and select and experiment with techniques to reduce and contain its spread.
- ✓ Maintain fences to control trespass of cattle or feral horses.
- ✓ Determine historical fire return intervals and how prescribed fire may help maintain this healthy grassland.
- ✓ Modify existing fences to allow the passage of pronghorn.
- ✓ Develop baseline inventory and monitoring plans for grassland birds (burrowing owl, sparrows) and vegetation.

■ **Goal D: Minimize wildlife exposure to environmental contaminants on or adjacent to the Refuge.**

Potential large scale irrigation system development, authorized through the Desert Land Entry Act of 1877, on BLM lands north of the Refuge may magnify selenium contamination in Refuge wetlands. Excess irrigation runoff that leaches through naturally occurring selenium-laden soils can become contaminated. As the Refuge lies in a lowland area below agricultural fields, irrigation water may ultimately deposit more selenium on the Refuge. The Refuge will continue its close working relationship with the BLM on this issue.

The Refuge is proposing partial removal of the protective levee and modifications to the interior dikes of S3 and S5 to facilitate the dilution of selenium within Sheppard Bottom. Please refer to the Issues Section (Selenium) and the Selenium Project Map (#4) for additional information on this proposed project.

**Objective 1: Reduce the selenium concentration on 240 acres within Sheppard Bottom S-3/S-5.**

Strategies:

- ✓ The Refuge will actively work with Ecological Services, the National Irrigation Water Quality Program, the Bureau of Land Management, and other experts to minimize selenium contamination in North and South Roadside Draw, in Sheppard Bottom and any other portions of the Refuge.
- ✓ The Refuge will assist with sampling and data collection, and contribute funding to the program.
- ✓ The Refuge will propose partial removal of the protective levee and complete removal of the S-3/S-5 dike to allow flow through to the Green River. A separate Environmental Assessment will be prepared for this project.
- ✓ Disperse contaminated water to accelerate evaporation, encourage growth of phreatophytes.
- ✓ Transplant cottonwoods and willow along South Roadside Draw to convert the existing open-water wetland into a riparian corridor.
- ✓ Participate with other agencies and the general public during regional irrigation water planning and development.

■ **Goal E: Ouray NWR will promote and enhance opportunities for compatible wildlife- dependent recreation.**

**Objective: Provide opportunities for wildlife photography, wildlife observation, hunting, and fishing.**

Strategies:

- ✓ By the year 2005, two new nature trails will be developed. Both trails will provide access to riparian and wetland habitats. These trails will be interpreted, and at least one will be universally accessible. Solicitation for potential challenge cost share partners will be initiated upon approval of this Plan.
- ✓ The Refuge will continue to provide hunting and fishing opportunities. Huntible species will include mule deer, waterfowl and ring-necked pheasant in defined units of the Refuge. Fishing in accordance with State regulations is allowed along the Green River. At least one hunting and one fishing site will be made universally accessible.
- ✓ Evaluate feasibility of opening Johnson Bottom to waterfowl hunting.

■ **Goal F: Increase awareness of the Refuge and the role of the Refuge in wildlife and fisheries management, the National Wildlife Refuge System, and the UCRE for visitors and local communities through environmental education, and interpretation.**

**Objective: Inform visitors and local communities about the fish and wildlife that depend on the Green River and the Refuge's role in protecting these resources.**

Strategies:

- ✓ Ouray NWR will renovate the self-guided auto-tour route through Sheppard Bottom and Leota Bluff. By the year 2003, current signs will be replaced with stand-alone interpretive signs to provide information about Refuge habitat, migratory birds, endangered fish, and the NWR system.
- ✓ By the year 2000, Refuge staff will revise the general brochure to update information and to comply with the Service's publications format. Additionally, distribution of the brochure in local communities will be increased.
- ✓ Refuge personnel will dedicate 8-10 days every spring and fall to conduct Refuge tours with local schools and community groups. A local volunteer will be recruited and trained to assist with tours and possibly expand the program.
- ✓ During the annual spring open house, Refuge staff and volunteers will focus on topics related to Migratory Bird Day, Wetlands Day, Fishing Week, and other natural resource issues. Topics showcased in the fall will include the National Wildlife Refuge System, National Wildlife Refuge Week, and wildlife-dependent uses of the Refuge, such as hunting and fishing.
- ✓ Refuge staff will continue to participate in community events, teacher workshops, and natural resource career development workshops for students in an effort to strengthen community recognition and support of the USFWS mission.

- **Goal G: Provide protection for cultural and paleontological resources on the Refuge and educate visitors about these sites.**

**Objective 1: Protect cultural and paleontological resources on the Refuge.**

Strategies:

- ✓ Consult with local experts from other land management agencies, individuals, and interested groups to compile information on potential cultural and paleontological resource sites and materials in the Refuge area.
- ✓ Conduct a cultural resource overview for the Refuge area.
- ✓ Develop a cultural resource/paleontological management plan. The plan will describe Refuge-wide resource inventories, define what stabilization and protection measures will be needed at located sites.

**Objective 2: Inform visitors and the local community about cultural and paleontological resources on the Refuge.**

Strategy:

- ✓ Incorporate messages about these resources into existing educational materials by designing interpretive and educational exhibits and brochures to raise the awareness of visitors about these resources.



# *Implementation and Monitoring*

Plan implementation is contingent upon the following additional funding and personnel.

## Funding and Personnel

<b>Project</b>	<b>Estimated Project Cost</b>
Create Nature Trails	\$17,000
Complete Disabled Access Hunting and Fishing Sites	\$25,000
Renovate Self-Guided Auto Tour Route	\$19,000
Develop Refuge Interpretive Brochures	\$5,000
Control Selenium Contamination	\$95,000
Increase Treatment of Pest Plants	\$98,000
Apply Habitat Treatments and Monitoring (Easement Work etc.)	\$200,000

## Permanent Personnel Needed

Funding for two additional permanent employees is needed to implement this Plan. The new Biological Technician position will be responsible for Colorado River Wildlife Management Area easement enforcement and monitoring and assisting the refuge biologist. With the addition of the Colorado River Wildlife Management Area, the level of complexity merits grade increases for the Refuge Manager and Refuge Operations Specialist.

<b>Current Personnel</b>	<b>Personnel Needed</b>
Refuge Manager, GS-12	Refuge Manager, GS-13
Sup. Refuge Operation Specialist, GS-11	Sup. Refuge Operation Specialist, GS-12
Engineering Equipment Operator, WG-10	Engineering Equipment Operator, WG-10
Maintenance Worker, WG-8 (shared with Ouray Fish Hatchery)	Maintenance Worker, WG-8 (full-time Refuge)
Wildlife Biologist, GS-9/11	Wildlife Biologist, GS-11
Outdoor Recreation Planner, GS-9	Outdoor Recreation Planner, GS-11
Administrative Support Assistant, GS-7 (shared w/Jones Hole and Ouray Hatcheries)	Administrative Support Assistant, GS-8 (shared with Ouray Hatchery)
Vacant	Biological Technician, GS-5/6

## Step-down Management Plans

In addition to administrative plans required by national policies and guidance, step-down plans that need periodic revision or will need to be developed to augment this CCP include:

- Habitat Management Plan
- Cultural/Paleontological Resource Plan
- Hunting Plan
- Integrated Pest Management Plan
- Fire Management Plan
- Wildlife Inventory Plan
- Wildlife Conservation Plan
- Public Use Plan
- Water Management Plan
- Trapping Plan

## Monitoring and Evaluation

Refuge staff will continue to monitor avian (e.g., migratory songbirds) productivity and survivorship through the continuation of the constant effort mist-netting (CEMN). Mist-netting has been conducted in riparian areas on Ouray since 1996 and should continue as long as feasible to evaluate management and control of nonnatives, varying flooding regimes as dictated by the flow out of Flaming Gorge, and other changes as may occur naturally or artificially. Additionally, point counts will be conducted throughout the length of the riparian area occurring on the Refuge to complement CEMN. Also, vegetation on point counts will be monitored according to standards as provided by the Region.

Baseline inventories of small mammals, reptiles and amphibians were initiated during spring and summer of 1999. These inventories have verified certain species' occurrence on the Refuge, such as the Merriam's shrew. Although the efforts carried out are respectable, they still fall short of a complete inventory, as our previous efforts failed to sample some of the known species that occur on the Refuge. Obtaining this information is vital for evaluating future management plans, such as prescribed burning, nonnative weed control, mowing, and other efforts outlined in the CCP.

Levee removal or breaching has occurred in Johnson, Leota, and Woods Bottom to benefit endangered fish, particularly razorback suckers and Colorado pikeminnow. The Recovery Program, UDWR, and other researchers including Utah State University continue to monitor and evaluate the actual benefits of these levee removals to endangered fish recovery and riparian vegetation regeneration (e.g., cottonwoods and willows). Management decisions within levee removal sites may be reached using recommendations provided by the researchers. In the future, proposed levee removals on the Refuge will be evaluated on a case-by-case basis and on recommendations provided by past research.

Before appropriate management objectives can be developed for riparian and upland habitats, past, present, and potential vegetation structure and composition needs to be determined. Past information can be gathered using aerial photographs of riparian areas before regulated flows, soil surveys, existing diaries of explorers, and Refuge annual narratives. Present information can be collected through baseline inventories, while potential vegetation structure information can be gleaned from the scientific literature on potential natural communities or climax communities. Only when past, present, and potential vegetation structure and composition are determined and evaluated for compatibility with present day conditions (e.g., river flows, nonnative vegetation, etc.), can specific objectives and monitoring techniques be developed for riparian and upland habitats.

In order to control the rate of spread of nonnative species such as Tamarix, Russian olive, Russian knapweed, and perennial pepperweed, Refuge staff will evaluate different treatments and control mechanisms for the most efficient form of suppression. We will evaluate the use of different chemicals, concentrations, chemicals in combination with mechanical treatments like mowing and discing, prescribed burning, and chemicals in combination with prescribed burning. Plots of various sizes with various treatments assigned to each plot will be used to monitor the effects of the different treatments.

Implementation of the Plan will be monitored throughout its effective period (2000 through 2014).

Accomplishment of objectives listed in this Plan will be monitored annually by the Refuge Manager's supervisor. Monitoring of accomplishments is critical to the implementation of the Plan.

It is reasonable to believe that substantial changes could occur within the Service during the next 15 years. The objectives of the Plan will be examined a minimum of every five years to determine if revisions are necessary and to allow the addition or deletion of objectives.

## Partnership Opportunities

Potential Partners for various Refuge activities are:

### **Salt Lake City Audubon Society**

Refuge staff will support the "Adopt-A-Refuge" initiative sponsored by the National Audubon Society.

### **Utah Division of Wildlife Resources**

Refuge staff will continue law enforcement and management of wildlife both on and off the Refuge.

### **Uintah County**

Refuge staff will continue its close working relationship with the Uintah County Mosquito Abatement District, Uintah County Weed Department, and the Uintah County Commissioners.

### **Vernal Area and Duchesne Area Chamber of Commerce**

Refuge staff will continue to provide Refuge literature and news release on Refuge activities to both Chambers of Commerce

### **Dinosaurland Travel Board**

Refuge staff will continue its cooperative agreement to pay a share of the cost for the local radio broadcast service.

### **Northeastern Utah Visitor Center**

Refuge staff will continue to provide Refuge literature, and seasonal updates for the local radio Refuge announcement.

### **Utah Field House of Natural History**

Refuge will continue to support interpretive displays on the activities of the U.S. Fish and Wildlife Service in the Uintah Basin.

### **Bureau of Land Management**

Refuge staff will continue its partnership with the BLM through sharing equipment, staff, and innovative ideas on how to control selenium contamination on the Refuge.

### **Uintah Basin Interagency Fire Center**

The Refuge will continue its participation in providing wildfire suppression equipment and staff within the ecosystem.

### **Ducks Unlimited**

Ducks unlimited maybe interested in assisting with wetland habitat improve projects on the Refuge.

### **Dinosaurland Resource Conservation and Development**

Refuge staff will continue to support RC&D activities in an effort to share our knowledge of the resource with the local community.

### **Vernal Junior High Escape Club**

Refuge staff will continue to seek assistance for natural resource improvement projects from the Vernal Junior High Escape Club.

### **Boy Scouts of America**

Refuge staff will continue its partnership with local troops who have been instrumental in providing assistance to the Refuge.

# *Appendix A. Glossary*

**Alluvial fan-** A fan-shaped deposit of soil carried by water that accumulates at the mouth of a ravine, a streambed, or gully. Often distinctly different from soils surrounding it.

**Benchlands-** For the purposes of this document, benchlands refer to the flatter terrain on the clay bluffs that form a sort of remnant bank bordering the river valley on the Refuge.

**Biodiversity-** The variety of living organisms considered at all levels of organization, including the genetic, species, and higher taxonomic levels, and the variety of habitats and ecosystems, as well as the processes occurring therein (Meffe et al. 1997).

**Biome-** A large, regional ecological unit, usually defined by some dominant vegetative pattern (Meffe et al. 1997).

**Bottomland Wetlands-** Periodically flooded areas or lakes that are adjacent to or in the riparian area.

**Cold Desert-** For the purpose of this document, it is a habitat that occurs at elevations greater than 4,600 feet, has a range of 2-7 inches of precipitation but averages about 3-4 inches and is characterized by the following vegetation: galleta grass, squirreltail, Indian ricegrass, shadscale, four-winged saltbush, greasewood, and some rabbitbrush and sagebrush (Holechek 1989, Payne and Bryant 1994).

**Cultural/Paleontological Resource-** Can be a fossil or a fossil bed, prehistoric artifacts, Indian midden site, historical structures, burial grounds, or other sites that are protected as antiquities by Federal law.

**Ecosystem-** Network of interactions of communities of plants and animals with energy, minerals, and nutrients from the sun, air, soil, and water in a manner that sustains life (Payne and Bryant 1994). For purposes of this document, ecosystem is in reference to the Upper Colorado Ecosystem which encompasses the watersheds, headwaters, tributaries, including the Green River and mainstem of the Colorado River in Wyoming, Utah, and Colorado.

**Emergents-** Plants that grow in water but protrude above the surface. Examples are cattail and hardstem bulrush.

**Endangered (species)-** A species which is in danger of extinction throughout all or a significant portion of its range.

**Extant-** A population of animals or plants that exists in its original wild state. A population of animals or plants that no longer exists in the wild is considered extirpated.

**Floodplain-** Level terrain that may be periodically subjected to and submerged by high river flows.

**Fragmentation-** Breaking wildlife habitat areas into smaller more isolated parcels, making movement of individuals or genetic information between parcels difficult or impossible.

**GIS-** Geographic Information System. Refers to such computer mapping programs as ArcView, ArcInfo, ERDAS, etc.

**Habitat-** A place where a plant or animal naturally or normally lives and grows.

**Hydrologic regime-** The local pattern and magnitude of water flow influenced by season.

**Impoundment-** A body of water created by collection and confinement within a series of levees or dikes thus creating separate management units although not always independent of one another.

**Larvicide-** A pesticide that targets the larval form of mosquitos to prevent them from maturing.

**Levee-** An embankment along the river to prevent water from overbank flooding. However, also used interchangeably with dike, which are embankments that separate management units or impoundments (Payne and Bryant 1994).

**Moist-Soil-** A process where water is drawn down intentionally or naturally to produce mudflats (i.e., moist soil) that are required for germination of many desirable plants (Baldassarre and Bolen 1994).

**Noxious (weed)-** Invasive (usually nonnative) vegetation that can grow and spread rapidly into monotypic stands when left unchecked by natural predators and enemies such as insects or diseases (Colorado Weed Management Association 1993).

**Overbank Flooding-** River flows that exceed the boundaries of the existing river channel and flood the adjacent riparian areas and bottomlands.

**Phenology-** Life cycle of a particular species.

**Phreatophytes-** plants whose roots penetrate to the water table.

**Physiographic-** Physical geography of a particular region of the U.S.

**Prescribed Fire-** The intentional application of fire to vegetation under specific environmental conditions to accomplish specific management objectives in specific areas identified in approved prescribed burn plans

**Riparian-** Plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent flowing or still water bodies. These areas have one or both of the following characteristics: 1) distinctively different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland (Dall et al. 1997).

**Spatial distribution-** The pattern or frequency of a specific habitat type over a larger area.

**Species composition-** A group of species that inhabit a specific habitat type in its healthy state. To enhance species composition is to ensure that all or as many species as possible inhabit the appropriate habitat by improving the quality of that habitat.

**Step-down management plan-** A management plan that describes in full detail the day-to-day activities of programs such as environmental education and outreach, cooperative farming, controlled burning, habitat management for specific sites, public hunting and fishing, facilities upgrade and maintenance, wildlife population research, etc.

**Submergents-** Plants that grow in water but tend to float within and are supported by it. They do not protrude much above the water surface. Examples are pondweeds and marestalk.

**Threatened (species)**- Any species which is likely to become endangered in the near future.

**Transect**- A predetermined route for taking samples of plants or observing wildlife.

**Turbidity**- Cloudiness of a water body caused by suspended silt, mud, pollutants, or algae.

**Understory**- Shrubs and herbaceous plants that typically grow beneath larger trees in a woodland.

**Waterbirds**- For the purposes of this document, this includes birds that depend upon water for some or all stages in their life history and are in the *Podicipedidae* (grebe), *Pelecanidae* (pelican), *Phalacrocoracidae* (cormorant), *Ardeidae* (bittern, heron, egret), *Threskiornithidae* (ibis), *Gruidae* (crane), *Anatidae* (swan, goose, duck), *Rallidae* (rail, coot), *Recurvirostridae* (stilt, avocet), *Charadriidae* (plover), *Scolopacidae* (sandpiper), and *Laridae* (gull) families.

**Wildlife-dependent recreation**- Defined by the National Wildlife Refuge System Improvement Act of 1997 as hunting, fishing, wildlife observation, wildlife photography, interpretation, and environmental education.

# **Appendix B.**

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# Appendix C. RONS List

## ACTIVITY: Pest Plant Control

MEASURES: 3000 acres will be treated; 3000 acres infested by target species; 3000 acres will be treated chemically

### Invasive Plant Control

Reverse infestation of invasive plants to favor native plant communities through the use of new herbicide spray equipment and a full time employee to map, monitor and apply the necessary control measures. Four species of invasive vegetation (Tamarisk, Russian olive, Tall White top and Russian Knapweed) have become well established and now threaten native vegetation and wildlife. Approximately 75% of the riparian area of this refuge is severely invaded by these species. The Ouray NWR serves as vital migrational habitat for numerous species of birds and as critical habitat for four species of endangered fish.

### ADDITIONAL FUNDS NEEDED (\$000):

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....		43	
Equipment Cost.....	40		
Facility Cost.....			
Services/Supplies.....	10	20	
Miscellaneous Costs.....	40	5	
TOTAL Operations Cost.....	90	68	158

### ADDITIONAL PERMANENT STAFF NEEDED:

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....		\$0
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....	1.0	\$43
TOTAL FTEs Needed.....	1.0	\$43

EMPHASIS: 0% Critical health & safety; 50% Critical resource protection; 25% Critical mission; 25% Other important needs

OUTCOMES*:	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
	10	10	5	70			5				100

PLANNING LINKS: Station Goal/Objective; Station CCP approved 10/97+; Station Step-down Management Plan; FWS Ecosystem Goal/Plan

Loss of native plant communities will not meet the objectives of: the refuge CCP, the Integrated Pest Management Plan or the FWS Ecosystem goals. Ecosystem goal #2: restore, maintain, enhance ecosystem function of wetland & riparian habitats." Draft CMP refuge goal: 1) maintain/enhance habitat for migratory birds. 2) restore/maintain native plant communities 3) reduce nonnative noxious plants.

PROJECT #: 97005 RANK - STATION: 1 DISTRICT: 007 REGION: 7 NATIONAL:

**ACTIVITY: Wetland Restoration****MEASURES: 1790 refuge acres will be restored****Restore Leota/Sheppard Wetlands**

The two primary wetlands of the Ouray NWR (Leota & Sheppard Bottoms) have historically been utilized annually by thousands of waterfowl, and shore birds. Degraded drain structures no longer allow for adequate drainage and the wetlands have now become dense stands of cattail which do not afford ample open water. Restoration of these wetlands would require replacing the interior drain structures and root plowing to sever and expose the cattail root mass. The refuge would contract the drain structure construction to the Bureau of Reclamation and purchase a D7 dozer and root plow to perform the plowing ourselves.

**ADDITIONAL FUNDS NEEDED (\$000):**

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....			
Equipment Cost.....	120		
Facility Cost.....			
Services/Supplies.....	200		
Miscellaneous Costs.....	31		
<b>TOTAL Operations Cost.....</b>	<b>351</b>		<b>351</b>

**ADDITIONAL PERMANENT STAFF NEEDED:**

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....		\$0
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....		\$0
<b>TOTAL FTEs Needed.....</b>		<b>\$0</b>

**EMPHASIS:** 0% Critical health & safety; 75% Critical resource protection; 0% Critical mission; 25% Other important needs

<b>OUTCOMES*:</b>	<b>ES</b>	<b>WF</b>	<b>OMB</b>	<b>HEC</b>	<b>IAF</b>	<b>SDA</b>	<b>RW</b>	<b>PED</b>	<b>FAR</b>	<b>PRC</b>	<b>TOT</b>
		80	20								100

**PLANNING LINKS:** Station CCP approved 10/97+; Legal Mandate

The Ouray Refuge CCP identifies the need to maintain Leota and Sheppard Bottom under a 50:50 open water to vegetative cover ratio. The Ouray Refuge enabling legislation used to establish the refuge focuses primarily on managing for migratory birds.

**PROJECT #:** .....99001..... **RANK - STATION:** .....2..... **DISTRICT:** .....999..... **REGION:** .....122..... **NATIONAL:** .....999.....

**ACTIVITY: Provide Visitor Services****MEASURES: 8000 new visitors will be served; 3500 existing visitors will be served****Interpretation and Recreation Improvements**

The Ouray Refuge was established in 1960 and very few interpretation and recreation facilities have ever been constructed. The refuge lies 30 miles south of Vernal, Utah which receives in excess of 1 million visitors annually. At present many of our visitors are from the Salt Lake City area just 3 hours drive to the west. The refuge has tremendous potential to provide the general public with a positive U.S. Fish and Wildlife Service Refuge experience. Development of interpretive panels, nature trails, photo blinds, hunting blinds, and interpretive stops along nature trails and the auto tour route would greatly improve the refuge visitors experience.

**ADDITIONAL FUNDS NEEDED (\$000):**

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....			
Equipment Cost.....	10		
Facility Cost.....	90		
Services/Supplies.....	10	5	
Miscellaneous Costs.....	20	5	
<b>TOTAL Operations Cost.....</b>	<b>130</b>	<b>10</b>	<b>140</b>

**ADDITIONAL PERMANENT STAFF NEEDED:**

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....		\$0
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....		\$0
<b>TOTAL FTEs Needed.....</b>		<b>\$0</b>

**EMPHASIS:** 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 0% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 100% Other capital improvements

<b>OUTCOMES*:</b>	<b>ES</b>	<b>WF</b>	<b>OMB</b>	<b>HEC</b>	<b>IAF</b>	<b>SDA</b>	<b>RW</b>	<b>PED</b>	<b>FAR</b>	<b>PRC</b>	<b>TOT</b>
								50		50	100

**PLANNING LINKS:** Station Goal/Objective; Legal Mandate; Station CCP approved 10/97+

Executive order No 12996 signed by President Clinton on March 25, 1996 recognizes the importance of wildlife dependent recreation activities, public use and education. Draft CCP refuge goal 5-6 provides for compatible wildlife dependent recreation and public interpretation of wildlife and natural processes.

**PROJECT #:** .....28001..... **RANK - STATION:** .....3..... **DISTRICT:** .....066..... **REGION:** .....78..... **NATIONAL:**



**ACTIVITY: Fire Management****MEASURES: 2000 refuge acres burned under prescription; 10 refuge burns will be conducted; 5 wildfires will be suppressed****Restore Riparian Cottonwood Forest and Wetlands**

The Ouray Refuge consists of 12 river miles lined with a fragile cottonwood canopy and bordered by shallow wetlands. This habitat type is very rare within the Green River drainage. Preservation and enhancement of this habitat type relies on aggressive wildfire suppression within the cottonwood canopy and tightly controlled prescribed fire of the boarding shallow wetlands. The preservation and management of these habitats requires adequate fire fighting equipment. The construction of a fire cache building, supplies, and an additional fire engine would allow for ample protection of this rare habitat type.

**ADDITIONAL FUNDS NEEDED (\$000):**

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....			
Equipment Cost.....	95		
Facility Cost.....	50		
Services/Supplies.....	10	5	
Miscellaneous Costs.....	19	5	
<b>TOTAL Operations Cost.....</b>	<b>174</b>	<b>10</b>	<b>184</b>

**ADDITIONAL PERMANENT STAFF NEEDED:**

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....		\$0
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....		\$0
<b>TOTAL FTEs Needed.....</b>		<b>\$0</b>

**EMPHASIS:** 0% Critical health & safety - deferred maintenance; 0% Critical health & safety - capital improvement; 0% Critical resource protection - deferred maintenance; 50% Critical resource protection - capital improvement; 0% Critical mission - deferred maintenance; 0% Compliance & other deferred maintenance; 50% Other capital improvements

<b>OUTCOMES*:</b>	<b>ES</b>	<b>WF</b>	<b>OMB</b>	<b>HEC</b>	<b>IAF</b>	<b>SDA</b>	<b>RW</b>	<b>PED</b>	<b>FAR</b>	<b>PRC</b>	<b>TOT</b>
	10	70	10	10							100

**PLANNING LINKS:** Station Goal/Objective; Other Major Plan; Station CCP approved 10/97+; Station Step-down Mgmt Plan

The draft refuge CCP and the step-down Fire Management Plan address the need for the improved fire fighting resources. At present the refuge is supplied with one fire engine and a slip on pumper which is not safe to load and unload. A designated storage location would allow for quick mobilization thus reducing the damage to the natural resource. The refuge has experienced numerous damaging wildfires in the recent past.

**PROJECT #:** .....98002..... **RANK - STATION:** .....4..... **DISTRICT:** .....999..... **REGION:** .....999..... **NATIONAL:**

**ACTIVITY: Studies & Investigations****MEASURES: 1 studies will be conducted****Initiate a Natural Flood Regime Study**

Initiate a study to evaluate the feasibility and effects of restoring natural flood regimes of all six Refuge bottomlands. The study would take into consideration the engineering mechanics of levee removal and the potential effects on the habitat and its wildlife. The refuge Comprehensive Conservation Plan (CCP) identifies management under natural flood regimes as a possible alternative. This study would be carried out by a University such as Utah State or private engineering firm.

**ADDITIONAL FUNDS NEEDED (\$000):**

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....			
Equipment Cost.....	30		
Facility Cost.....			
Services/Supplies.....	100		
Miscellaneous Costs.....	21	2	
<b>TOTAL Operations Cost.....</b>	<b>151</b>	<b>2</b>	<b>153</b>

**ADDITIONAL PERMANENT STAFF NEEDED:**

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....		\$0
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....		\$0
<b>TOTAL FTEs Needed.....</b>		<b>\$0</b>

**EMPHASIS:** 0% Critical health & safety; 50% Critical resource protection; 25% Critical mission; 25% Other important needs

<b>OUTCOMES*:</b>	<b>ES</b>	<b>WF</b>	<b>OMB</b>	<b>HEC</b>	<b>IAF</b>	<b>SDA</b>	<b>RW</b>	<b>PED</b>	<b>FAR</b>	<b>PRC</b>	<b>TOT</b>
	20	20	20	30			5		5		100

**PLANNING LINKS:** Station Goal/Objective; FWS Recovery Plan; FWS Ecosystem Goal/Plan; Station CCP approved 10/97+

The refuge CCP identifies one of its alternatives as management under a natural flood regime without the hindrance of man-made levees. The Colorado River Recovery Program has identified the lack of wetland access by the endangered fish as the greatest limiting factor. A feasibility study would provide the needed information for considering such a massive undertaking.

**PROJECT #:** .....92002..... **RANK - STATION:** .....8..... **DISTRICT:** .....999..... **REGION:** .....999..... **NATIONAL:**

**ACTIVITY: Outreach**

**MEASURES:** 5000 participants will be at group presentations; 100000 people will view off-site exhibits; 5 news releases will be issued; 3 TV or radio spots will be developed; 4 other special events will be hosted

**Outreach Program**

Develop an outreach program for three school districts, a local interagency visitor center, local clubs, special tours and events. Ouray NWR provides an excellent opportunity to educate the public about wetland riparian and endangered species values. The Ouray National Fish Hatchery (an endangered fish facility) would be an excellent place for public resource education. Very little environmental education is being done in schools or the local community. This project would be accomplished with our existent Outdoor Recreation Planner.

**ADDITIONAL FUNDS NEEDED (\$000):**

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....			
Equipment Cost.....	15		
Facility Cost.....			
Services/Supplies.....	10	5	
Miscellaneous Costs.....	8	5	
<b>TOTAL Operations Cost.....</b>	<b>33</b>	<b>10</b>	<b>43</b>

**ADDITIONAL PERMANENT STAFF NEEDED:**

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....		\$0
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....		\$0
<b>TOTAL FTEs Needed.....</b>		<b>\$0</b>

**EMPHASIS:** 0% Critical health & safety; 0% Critical resource protection; 80% Critical mission; 20% Other important needs

<b>OUTCOMES*:</b>	<b>ES</b>	<b>WF</b>	<b>OMB</b>	<b>HEC</b>	<b>IAF</b>	<b>SDA</b>	<b>RW</b>	<b>PED</b>	<b>FAR</b>	<b>PRC</b>	<b>TOT</b>
								80		20	100

**PLANNING LINKS:** Station Goal/Objective; Legal Mandate

Executive Order No. 12996 dated 3/25/96, recognizes importance of wildlife dependent recreation, public use and education. Draft CCP refuge goals identifies public interpretation of wildlife and natural processes.

**PROJECT #:** .....97010..... **RANK - STATION:** .....6..... **DISTRICT:** ....056... **REGION:** ....999... **NATIONAL:**

**ACTIVITY: Cultural Resource Management****MEASURES: 1 investigations will be conducted; 5 sites will be documented; 1 museum property items will be maintained****Archeological Resource Inventory**

Ouray NWR is located astride the Green River in northeastern Utah. This semi-desert area is well known for its arid clay soils and its ability to sustain preserved artifacts in good to excellent condition. Some of the items discovered consist of dinosaur bones and Native American artifacts. The Green River is known for being a major traveling corridor for Native Americans, Spanish explorers, trappers and early century ranchers. Very little of this refuge has been investigated for archeological resources. This project proposal calls for a sample inventory of 11,987 acres. This project could potentially be done through partnership with a University under a challenge cost share.

**ADDITIONAL FUNDS NEEDED (\$000):**

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....			
Equipment Cost.....	10		
Facility Cost.....			
Services/Supplies.....	80		
Miscellaneous Costs.....	23	60	
<b>TOTAL Operations Cost.....</b>	<b>113</b>	<b>60</b>	<b>173</b>

**ADDITIONAL PERMANENT STAFF NEEDED:**

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....		\$0
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....		\$0
<b>TOTAL FTEs Needed.....</b>		<b>\$0</b>

**EMPHASIS:** % Critical health & safety; 100% Critical resource protection; 0% Critical mission; % Other important needs

<b>OUTCOMES*:</b>	<b>ES</b>	<b>WF</b>	<b>OMB</b>	<b>HEC</b>	<b>IAF</b>	<b>SDA</b>	<b>RW</b>	<b>PED</b>	<b>FAR</b>	<b>PRC</b>	<b>TOT</b>
								100			100

**PLANNING LINKS:** Station Goal/Objective; Station CCP approved 10/97+; Legal Mandate

The Ouray Comprehensive Conservation Plan (CCP) identifies the need for a thorough archeological survey of the refuge.

**PROJECT #:** 97009      **RANK - STATION:** 7      **DISTRICT:** 999      **REGION:** 999      **NATIONAL:**



**ACTIVITY: Private Land Activities (excluding restoration)****MEASURES:** 50 landowners will be assisted; 10000 acres will be affected; 10000 % effort will be for wetlands**Easement Monitoring and Enforcement**

The Colorado River Recovery Program for endangered fishes is currently negotiating long term conservation easement acquisitions of flooded bottom lands and riparian areas along the Green, Colorado and Gunnison Rivers. These properties are to be managed and administered by the Ouray NWR. The Refuge welcomes this responsibility and recognizes the need for the protection of these critical habitat not only for fish but for many other species. This proposal seeks to insure sustained long term monitoring and enforcement of these critical habitats through the hiring of a permanent full-time biological technician with law enforcement authority and all the necessary equipment.

**ADDITIONAL FUNDS NEEDED (\$000):**

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	30	39	
Equipment Cost.....	40		
Facility Cost.....			
Services/Supplies.....	5	5	
Miscellaneous Costs.....	26	5	
<b>TOTAL Operations Cost.....</b>	<b>101</b>	<b>49</b>	<b>150</b>

**ADDITIONAL PERMANENT STAFF NEEDED:**

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....	1.0	\$39
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....		\$0
<b>TOTAL FTEs Needed.....</b>	<b>1.0</b>	<b>\$39</b>

**EMPHASIS:** 0% Critical health & safety; 50% Critical resource protection; 25% Critical mission; 25% Other important needs

<b>OUTCOMES*:</b>	<b>ES</b>	<b>WF</b>	<b>OMB</b>	<b>HEC</b>	<b>IAF</b>	<b>SDA</b>	<b>RW</b>	<b>PED</b>	<b>FAR</b>	<b>PRC</b>	<b>TOT</b>
	90	5	5								100

**PLANNING LINKS:** FWS Recovery Plan; FWS Ecosystem Goal/Plan

The Colorado River Recovery program will be acquiring conservation easements to promote more natural flooding of the Upper Colorado River ecosystem. Ecosystem goals: 1)...Restore and maintain an aquatic system capable of supporting the diversity of native aquatic communities to achieve recovery of listed and candidate species and prevent the need of future listing. 2)...Reverse current trend; restore/maintain/enhance species composition and wetland/riparian habitats.

**PROJECT #:** .....97007..... **RANK - STATION:** .....8..... **DISTRICT:** .....999... **REGION:** .....999... **NATIONAL:**

**ACTIVITY: Surveys & Censuses****MEASURES: ; 3 habitat surveys will be conducted****Survey of Endangered Hookless Cactus**

Unita Basin Hookless Cactus, an endangered species, has been discovered on the Ouray NWR. There presence was documented over eight years ago and not much is known on its distribution. A detailed survey of specific locations, numbers of cactus, documentation of successful reproduction, and possible conflicts resulting from refuge management practices and public use will be obtained. Endangered plants are often overlooked in refuge management however, these species are important and their protection and management will facilitate species recovery and sound ecosystem management.

**ADDITIONAL FUNDS NEEDED (\$000):**

	One-Time	Recurring Base	First Year Need
Construction Costs.....			
Operations: Personnel Costs.....	30	16	
Equipment Cost.....	30		
Facility Cost.....			
Services/Supplies.....	5		
Miscellaneous Costs.....	12		
TOTAL Operations Cost.....	77	16	93

**ADDITIONAL PERMANENT STAFF NEEDED:**

	FTEs	Cost (\$000)
Managers.....		\$0
Biologists.....	0.5	\$16
Resource Specialists.....		\$0
Education/Recreation Staff.....		\$0
Law Enforcement.....		\$0
Clerical/Administrative.....		\$0
Maintenance/Equipment Operation.....		\$0
TOTAL FTEs Needed.....	0.5	\$16

**EMPHASIS:** 50% Critical health & safety; 0% Critical resource protection; 50% Critical mission; 0% Other important needs

<b>OUTCOMES*:</b>	ES	WF	OMB	HEC	IAF	SDA	RW	PED	FAR	PRC	TOT
	90			10							100

**PLANNING LINKS:** Station Goal/Objective; Station CCP approved 10/97+; Legal Mandate

Habitat surveys and management will be the focus of this activity on Ouray NWR to protect and recover an endangered plant species. We will assure that FWS management actions and public use are not negatively impacting this plant species and its habitat. This project is identified as an objective within the our draft CCP.

**PROJECT #:** .....97016..... **RANK - STATION:** .....9..... **DISTRICT:** .....999..... **REGION:** .....999..... **NATIONAL:**

# ***Appendix D.***

## ***Compatibility Determinations***

Station Name: Ouray National Wildlife Refuge

Date Established: May 25, 1960

### Establishing and Acquisition Authorities:

The Ouray National Wildlife Refuge (NWR) was established under the authority of the Migratory Bird Conservation Act “for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” At present (1994), the approved refuge boundary contains 11,987 acres which includes 2,692 acres of leased land from the Uintah and Ouray Ute Indian Tribe, 3,110 acres of withdrawn public domain, 1,153 acres of leased state lands, and 5,032 acres of fee title. All refuge lands are located in Uintah County, Utah.

### Purposes for which the Refuge was established:

For lands acquired under the Migratory Bird Conservation Act of 1929, 16 U.S.C. 715-715r; as amended, the purpose of the acquisition is “...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” 16 U.S.C. 715d (Migratory Bird Conservation Act).

### Refuge Goals and Objectives:

- P **Goal A:** Restore and enhance riparian and wetland habitats for migratory birds that depend upon the Green River corridor. Objectives are as follows:
1. Improve structure and composition of woody and herbaceous riparian communities to provide nesting, feeding, loafing, and resting habitat for migratory birds.
  2. Improve structure and composition of submergent and emergent wetland communities to provide nesting, feeding, loafing, and resting habitat for migratory waterbirds.
- P **Goal B:** Provide habitats that support the recovery of Federally listed and Utah state special status species on or adjacent to the Refuge. Objectives are as follows:
1. Provide habitats that support the recovery of Colorado River endangered fishes (razorback sucker, Colorado pikeminnow, humpback chub).
  2. Maintain populations of the Uintah Basin hookless cactus.
- P **Goal C:** Maintain healthy grassland (Indian rice grass, shadscale etc.) and semidesert shrubland habitats for wildlife. Objectives are as follows:
1. Investigate whether management techniques exist that can ensure the health of cold desert grasslands.
- P **Goal D:** Minimize wildlife exposure to environmental contaminants on or adjacent to the Refuge. Objective is as follows:
1. Reduce the selenium concentration on 240 acres within Sheppard Bottom S-3/S-5.
- P **Goal E:** Ouray NWR will promote and enhance opportunities for compatible wildlife-dependent recreation. Objective is as follows:
1. Provide opportunities for wildlife photography, wildlife observation, hunting, and fishing.

- P **Goal F:** Increase awareness of the Refuge and the role of the Refuge in wildlife and fisheries management, the National Wildlife Refuge System, and the upper Colorado River ecosystem for visitors and local communities through environmental education, interpretation. Objectives are as follows:
1. Inform visitors and local communities about the fish and wildlife that depend upon the Green River and the Refuge's role in protecting these resources.
- P **Goal G:** Provide protection for cultural and paleontological resources on the Refuge and educate visitors about these sites. Objectives are as follows:
1. Protect cultural and paleontological resources on the Refuge.
  2. Inform visitors and the local community about cultural and paleontological resources on the Refuge.

#### Other Applicable Laws, Regulations and Policies:

- P Antiquities Act of 1906
- P Americans With Disabilities Act of 1992
- P Architectural Barriers Act of 1968
- P Archaeological and Historical Preservation Act of 1974
- P Clean Water Act of 1977
- P Endangered Species Act of 1973 as amended (16 U.S.C. 1531-1543; 87 Stat. 884)
- P Executive Order 12996 Management and General Public Use of the National Wildlife Refuge System 1996
- P Federal Noxious Weed Act of 1990
- P Fish and Wildlife Act of 1956
- P Migratory Bird Hunting and Conservation Stamp Act of 1934
- P Migratory Bird Treaty Act of 1918 as amended (16 U.S.C. 703-712; 40 Stat. 755)
- P National Environmental Policy Act of 1969 as amended (PL. 91-190, 42 U.S.C. 4321-4347; 83 Stat. 852)
- P National Recreational Fisheries Policy of 1988
- P National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge Improvement Act of 1997 (PL. 105-57)
- P Native American Graves Protection and Repatriation Act of 1990
- P National Historic Preservation Act of 1966 as amended
- P Rehabilitation Act of 1973
- P Refuge Recreation Act of 1962 as amended (16 U.S.C. 460k-460k-4)

I. Description of Proposed Use: Wildlife Observation, Wildlife Photography, Recreational Fishing, Recreational Hunting, Environmental Education, and Interpretation.

The Comprehensive Conservation Plan for Ouray NWR includes opportunities for wildlife-dependent recreation on the Refuge. This recreation includes wildlife observation and photography, fishing, hunting, environmental education, and interpretation. Other activities which are allowed in support of these uses include hiking, bicycling, horseback riding, canoeing, and rafting.

Wildlife observation and photography are allowed along the 12-mile auto tour route through the wetland and riparian habitat of Sheppard Bottom and continuing up the arid bench land to the Leota Overlook. An observation tower located adjacent to the auto tour route and a wildlife viewing sight located north of the cropland provide wildlife observation opportunities as well.

Fishing is allowed on the Green River only. Primary fish species pursued include channel catfish, bullhead catfish, and northern pike. All regulations are in accordance with State fishing regulations. One State regulation states that the "Green River from the confluence with Colorado River upstream to Colorado State line in Dinosaur National Monument is closed to taking of nongame fish: except that carp may be taken by angling, archery, spear or scuba spearfishing." Fishing on the Refuge is allowed year round.

Hunting for waterfowl, pheasant, and mule deer is allowed in designated areas of the Ouray NWR. Waterfowl hunting is allowed on Leota Bottom. Hunting is allowed for pheasant and deer in Brennan, Johnson, Leota, and Wyasket Bottoms. Hunting regulations are in accordance with State of Utah and Federal laws.

Environmental education activities and interpretation programs are allowed on the Ouray NWR. These uses are allowed on the 12-mile auto tour route, the observation tower, the wildlife viewing area and other areas of the Refuge with prior approval from the Refuge manager. Annually, tours and programs are provided to schools. Refuge staff also participate in special Refuge sponsored activities such as Wetlands Day, International Migratory Bird Day, National Fishing Day, National Wildlife Week, and National Wildlife Refuge Week. These activities help inform and educate about 10,000 visitors annually.

#### Anticipated Impacts on Service Lands, Waters, or Interests:

Wildlife observation, photography, environmental education, and interpretation on the Ouray NWR is not expected to significantly impact any of the Refuge purposes. A majority of the use that occurs on the Refuge occurs along the 12-mile auto tour route. The remaining areas receive little or no disturbance. Approximately 10,000 people visit the Refuge annually, which is considered low impact when spread out over the entire year. Wildlife becomes accustomed to motor vehicles on the auto tour route and generally are not disturbed. Hiking, biking, and horseback riding have low use levels with minimal disturbance to wildlife.

Fishing on the Ouray NWR on the Green River is not expected to significantly impact any of the Refuge purposes. Migratory waterfowl concentrate on the managed wetlands of the Refuge and very little fishing pressure use occurs on the Green River itself. Most other migratory waterbirds including great blue herons, black-crowned night herons, cormorants, various shorebirds, egret, etc., also depend heavily on the managed wetlands and not the River. Bald eagle use occurs primarily in early and late winter when fishing pressure is virtually nonexistent, thus no conflict should occur.

This stretch of the Green River is used primarily by the federally endangered razorback sucker and Colorado pikeminnow. The endangered bonytail and humpback chub are rarely found in this portion of the River. Colorado pikeminnow were historically caught on rod and reel and may still occasionally be caught today. Information signs and notices will aid in educating the public on the need to release endangered fish species which have been caught, and should minimize loss of endangered fish.

Recreational hunting of waterfowl, pheasant, and mule deer on the Ouray NWR is not expected to significantly impact any of the Refuge purposes. The Refuge is 11,987 acres in size and hunting takes place on approximately 6,800 acres. Minor temporary disturbance to some Refuge wildlife using this riparian habitat zone may occur. The majority of developed wetlands, rookeries, and other habitats with large populations of migratory waterbirds are not located close to the River. Most other migratory birds including shorebirds and other waterbirds have migrated south by November and are not significantly affected by hunting. The remaining areas of the Refuge closed to hunting provide undisturbed waterfowl and waterbird habitat.

On occasion, endangered whooping cranes move through the Ouray NWR area in April and again in September-October. They rarely stop on the Refuge in the spring. Cranes mostly use the River and associated sandbars outside the hunting area. If a whooping crane was to use the hunting units, the areas would be temporarily closed to hunting. No significant impact on whooping cranes would be expected from this hunt.

#### Determination:

Wildlife Observation, Wildlife Photography, Recreational Fishing, Recreational Hunting, Environmental Education, Interpretation, and the other supporting uses (canoeing, rafting, hiking, horseback riding) are compatible with the purposes of the Refuge.

The following stipulations are required to ensure compatibility:  
Visitors are not allowed to camp overnight on the Refuge. No open fires are allowed anywhere on the Refuge as well.

The only area around the farm field open to the general public is the Wildlife Viewing site. Other areas adjacent to and within the field are closed year round.

The Refuge makes every effort to notify anglers of endangered fish concerns by posting endangered fish information posters, providing endangered fish information brochures at the kiosk, contacting as many anglers as possible, and providing state regulations with complete descriptions and pictures and cautions on endangered fish.

Fishing is limited to the Green River only. Access to fishing sites are via designated roads or by foot.

Refuge officers will be available to enforce Refuge and state regulations.

Vehicles are restricted to designated roads. Parking is available in designated areas.

#### Justification:

The wildlife observation, photography, environmental education and interpretation program on this Refuge is low impact with fairly low visitation. Wildlife disturbance is minimal and the benefits gained by providing these activities and information to visitors far outweigh any temporary disturbance which may occur to wildlife. This program is justified on this Refuge.

Recreational fishing on the Green River of the Ouray NWR will not likely interfere with endangered species needs and will not conflict with other Refuge purposes. Guided by the Refuge Recreation Act of 1962, which provides for recreational uses which are compatible with Refuge purposes and the National Recreational Fisheries Policy of 1988, which encourages enhancement of fishing opportunities on National Wildlife Refuges, this program is justified on this Refuge.

Recreational hunting on the Ouray NWR will not conflict with other Refuge purposes. The Ouray NWR is one of the few places open for waterfowl and pheasant hunting within the Uintah Basin. Guided by the Refuge Recreation Act of 1962, which provides for recreational uses that are compatible with Refuge purposes, this use is justified on the Refuge.

## II. Description of Proposed Use: Mosquito Control

The Ouray NWR lies within the Uintah County Mosquito Abatement District. The Refuge has many acres of shallow water, which is ideal mosquito rearing habitat. Uintah County has been documented with a high potential for serious incidence of mosquito-borne Western Equine Encephalitis and St. Louis Encephalitis. Six out of the last eight years of monitoring Encephalitis in a sentinel chicken flock by the Utah State Health Department has shown positive reactions in this flock. In 1978, over 60 documented cases of Western Equine Encephalitis were diagnosed. Mosquitoes reproducing on the Refuge have the potential to travel as far as the city of Vernal.

The Abatement District will treat up to 1,000 acres of Refuge wetland with *Bacillus thuringiensis israelensis* (BTI) at a rate of 1 pint of concentrate per acre. Application will be with either single engine fixed-wing aircraft or by ground treatment. BTI has been shown to be a target specific, biodegradable and environmentally compatible mosquito larvicide. Review and approval by FWS Region 6 Pesticide Review Committee has been completed.

Up to two treatments may be applied through the summer as monitoring of mosquito larvae indicates. Wetlands to be treated will be determined by the Abatement District and coordinated through the Refuge staff.

The Abatement District will closely monitor Refuge wetland habitat for mosquito habitat conditions and larvae populations. This will require several trips throughout the Refuge to monitor these conditions. Vehicle travel is limited to established roads and field monitoring or treatment evaluation must be done by foot.

### Anticipated Impacts on Service Lands, Waters, or Interests:

The abatement program will affect the Refuge purposes in several ways. Aerial applications will likely result in temporary disturbance and displacement of waterbirds and other wildlife. Actual treatment time by aircraft over any given wetland will be only a few minutes and should not result in permanent displacement of wildlife. Colonies of nesting waterbirds are located in Leota Bottom and Woods Bottom. This area will be off limits for aerial application and should not be impacted to a large degree. The first aerial applications will likely occur in mid-May when waterfowl are actively nesting. It is believed that only a minor disturbance to nesting waterfowl will occur and that production will not be affected.

Ground monitoring activities and application of BTI will result in some minor disturbance to wildlife. These activities, however, should be temporary in nature.

During the short time that application by aircraft takes place, negative aesthetic impacts could occur to Refuge visitors from low flying planes. Refuge visitation is very low in midsummer (due to mosquitoes) and will probably not affect anyone other than Refuge employees.

BTI is a selective, environmentally benign mosquito larvicide which will not affect other invertebrates or wildlife, including endangered fish species.



Determination:

Mosquito control on the Ouray NWR is compatible with the purposes of the Refuge.

The following stipulations are required to ensure compatibility:

The Refuge manager may further restrict access or locations of treatment in order to minimize disturbance in areas such as colonial nesting bird sites or areas with a high concentration of migratory birds.

The permittee will notify Refuge staff at least two days prior to ground or aerial application of BTI. At this time, Refuge staff will inform permittee of any sensitive areas and buffer areas which may require no treatment with BTI.

No vehicles may travel off designated roads. All persons must sign in and sign out at the Refuge shop which allows staff to know who is out on the Refuge during what time.

Gate keys will be provided and gates must be closed and locked at all times.

Justification:

These mosquito abatement activities will lower the adult mosquito populations in the vicinity of the Ouray NWR. Fewer adult mosquitoes will lessen the threat of Encephalitis health concerns. This treatment will meet abatement district responsibilities and improve relations with county neighbors. Mosquito control may enhance a positive Refuge visitor experience.

### III. Description of Proposed Use: Research

With the completion of Flaming Gorge Dam in 1962, many changes have occurred in the floodplain of the Green River below the dam and in the area of the Ouray NWR. Endangered fish nursery habitat, the geomorphology of the River, and increased numbers of nonnative fish species all may be effected by the changes incurred by damming the Green River. Utah State University, in conjunction with the Recovery Program and BOR, will conduct studies to contribute to the understanding of: 1) the effects of the River regulation on downstream ecosystems and how the dam might be operated to mitigate these effects; 2) how effective isolating important nursery habitats from nonnative predator fish will be; and 3) the needs and requirements of these endangered fish in the Green River.

Research activities will be conducted throughout the spring, summer and fall months. Two to three people will be going out three to five times per week, and each site will be accessed by vehicle on designated roads and by boat. Researchers will use electroshocking equipment, fyke nets, and light traps.

#### Anticipated Impacts on Service Lands, Waters, or Interests:

These studies should provide information on how Flaming Gorge Dam operations effect downstream channels, backwaters, wetlands, and resulting critical nursery habitat for endangered fish. Impacts to the Refuge lands should be very minimal and only temporary.

Minor, temporary disturbances to some Refuge wildlife using the riparian habitat zone along the River may occur. Waterbirds in the wetland areas may have substantial disturbance from activities associated with the research being conducted. Tree rookery sites of great blue herons and cormorants seem to be able to tolerate some activity without being overly disturbed.

Some disturbance to River backwaters may occur. These backwaters have been shown to be important areas for larval and young endangered fish including the razorback sucker and the Colorado pikeminnow. Some of these young fish may be displaced by this disturbance into the main River channel and be forced into other Refuge backwaters.

#### Determination:

Research conducted on the Ouray NWR is found to be compatible with the purposes of the Refuge.

#### The following stipulations are required to ensure compatibility:

Researchers will not be allowed to camp on the Refuge other than in the shop area and no pets will be allowed on the Refuge during research activities.

Trips to and from research sites need to be kept to a minimum and no vehicles shall leave designated roads without prior approval by the Refuge manager. For safety reasons, no vehicle use will be allowed in Leota Bottom during the hunting season. Boat access in the river during this time is permissible.

Further restrictions on access or activities may be necessary if concentrations of migratory birds were to occur on the Refuge. In addition, if other research proposals and activities become so numerous as to develop incompatible disturbances to each other and wildlife resources the compatibility of the studies will be reevaluated to minimize disturbances to wildlife.

#### Justification:

Research may result in a better understanding of the dynamics of this River system, what weak links may cause populations of four endangered fish species to decline, as well as what the important elements may be in managing River flows to maintain viable River biota. This information shall contribute to understanding the Green River ecosystem as a whole.

Temporary disturbances or displacements of some migratory birds will undoubtedly occur from these research activities. However, the knowledge gained about endangered fish biology should outweigh these migratory bird disturbances. Efforts will be taken to minimize these disturbances.

#### IV. Description of Proposed Use: Bee Hives

This activity would allow the continued issuance of a Special Use Permit for one site location for up to 30 bee hives on the Ouray NWR. Under this permit, the bee handler may place hives in the SW¼ of Section 15., T8S, R20E., which is located in a remote area of the Refuge just west of Sheppard Bottom.

The handler will be required to visit the hive site twice in May, twice in June, once each July, August, and October for a total of seven visits. These visits are for monitoring and caring for the bees and the collection of honey.

#### Anticipated Impacts on Service Lands, Waters, and Interests:

Bee hives placed on the Refuge will not have a significant impact on the Refuge purposes. Bees gathering pollen in this vicinity should help with the pollination of some flowering plants. The hives are located in a remote location which lies in an arid draw west of Sheppard Bottom. Little or no disturbance to migratory birds will occur during the season of honey collection. Minor disturbances to a few wildlife such as deer, pheasants, and rabbits may occur in this habitat zone, but only temporarily.

#### Determination:

Bee hives on the Ouray NWR are found to be compatible with the purposes of the Refuge.

#### The following stipulations are required to ensure compatibility:

Only one hive site is permitted as designated by the Refuge Manager. The site must remain neat and orderly. The hives must remain in the draw and out of sight of the visiting public.

The handler may access the hive site using the existing road or by foot. All activities and access to the bee hives by the permittee will be limited to daylight hours only.

#### NEPA Compliance:

Categorical Exclusion

Environmental Assessment

Environmental Impact Statement

FONSI

#### Signatures:

Project Leader: \_\_\_\_\_ Date: \_\_\_\_\_

Daniel M. Alonso  
Ouray NWR

Concurrence: \_\_\_\_\_ Date: \_\_\_\_\_

Refuge Supervisor

\_\_\_\_\_  
Date: \_\_\_\_\_

Assistant Regional Director  
Refuges and Wildlife

Approval: \_\_\_\_\_ Date: \_\_\_\_\_

Manager, Operations

# *Appendix E.*

## *Compliance Requirements*

**Antiquities Act (1906):** Authorizes the Scientific investigation of antiquities on Federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

**Americans With Disabilities Act (1992):** Prohibits discrimination in public accommodations and services.

**American Indian Religious Freedom Act (1978):** Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

**Architectural Barriers Act (1968):** Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

**Archaeological and Historical Preservation Act (1974):** Directs the preservation of historic and archaeological data in federal construction projects.

**Archaeological Resources Protection Act (1979) as amended:** Protects material of archaeological interest from unauthorized removal or destruction and requires Federal managers to develop plans and schedules to locate archaeological resources.

**Clean Water Act (1977):** Requires consultation with the Corps of Engineers (404 permits) for major wetland modification.

**Emergency Wetland Resources Act (1986):** Promotes the conservation of migratory waterfowl and offset or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitat, and for other purposes.

**Endangered Species Act (1973):** Requires all federal agencies to carry out programs for the conservation of endangered and threatened species.

**Executive Order 11988 (1977):** Each federal agency shall provide leadership and take action to reduce the risk of flood loss and minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplain.

**Executive Order 12996 Management and General Public Use of the National Wildlife Refuge System (1996):** Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the system.

**Executive Order 13007 Indian Sacred Sites (1996):** Direct Federal land management agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

**Federal Noxious Weed Act (1990):** Requires the use of integrated management systems to control or contain undesirable plant species; and an interdisciplinary approach with the cooperation of other Federal and State agencies.

**Fish and Wildlife Act (1956):** Establish a comprehensive national fish and wildlife policy and broadened the authority for acquisition and development of Refuges.

**Fish and Wildlife Coordination Act (1958):** Allows the Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

**Land and Water Conservation Fund Act (1965):** Uses the receipts from the sale of surplus Federal land, outer continental shelf oil and gas sales, and other sources for land acquisition under several authorities.

**Migratory Bird Conservation Act (1929):** Establishes procedures for acquisition by purchase, rental, or gift of areas approved by the Migratory Bird Conservation Commission.

**Migratory Bird Hunting and Conservation Stamp Act (1934):** Authorizes the opening of parts of a Refuge to waterfowl hunting.

**Migratory Bird Treaty Act (1918):** Designates the protection of migratory birds as a Federal responsibility. This Act enables the setting of seasons, and other regulations including the closing of areas, Federal or non-Federal to the hunting of migratory birds.

**Native American Graves Protection and Repatriation Act (1990):** Requires Federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

**National Wildlife Refuge System Administration Act of 1966 (Refuge Administration Act; 16 U.S.C. 668dd) as amended by the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act; PL. 105-57):** Defines the National Wildlife Refuge System and authorizes the Secretary to permit any use of a Refuge provided such use is compatible with the major purposes for which the Refuge was established. This law states that "....the Secretary shall—(1) propose a comprehensive conservation plan for each refuge or related complex of refuges... in the System." Section 5 and 7 of the Refuge Improvement Act provide additional detail on administration of and conservation planning for the Refuge System.

**National Historic Preservation Act (1966) as amended:** Establishes a policy that the Federal Government is to provide leadership in the preservation of the nation's prehistoric and historic resources.

**National Environmental Policy Act (1969):** Requires the disclosure of the environmental impacts of any major Federal action significantly affecting the quality of the human environment.

**Refuge Recreation Act (1962):** Allows the use of Refuges for recreation when such uses are compatible with the Refuge's primary purposes and when sufficient funds are available to manage the uses.

**Rehabilitation Act of (1973):** Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the Federal government to ensure that anybody can participate in any program.

# ***Appendix F***

## ***Mailing List***

### Federal Officials

- P Senator Orrin G. Hatch
- P Senator Bob Bennett
- P Congressman Merrill Cook
- P Congressman Chris Cannon
- P Congressman James V. Hansen

### Federal Agencies

- P Bureau of Indian Affairs, Dave Allison
- P Bureau of Land Management, Vernal and Salt Lake City, Utah
- P Bureau of Reclamation; Provo and Salt Lake City, Utah
- P Dinosaur National Park, Dinosaur, CO
- P Roosevelt Fish and Wildlife Management Assistance Office
- P USDA/Natural Resource Conservation Service
- P US EPA, Denver, CO
- P U.S. Fish and Wildlife Service: Denver, CO; Albuquerque, NM; Portland, OR; Anchorage, AK; Fort Snelling, MN; Atlanta, GA; Hadley, MA; Washington, D.C.; Shepherdstown, WV
- P U.S. Fish and Wildlife Service: Bear River Migratory Bird Refuge; Fish Springs NWR; Seedskadee NWR; Ecological Services, Salt Lake City; Brown's Park NWR.
- P U.S. Forest Service, Vernal, Utah

### State Officials

- P Governor Michael Leavitt
- P Senator Beverly Evans
- P Representative Jack Seitz

### State Agencies

- P Northeast Utah Visitor Center
- P RC&D, Sue Wight
- P School and Institutional Trust Lands Administration
- P UT Division of Wildlife Resources, Vernal and Salt Lake City
- P Utah State Historical Society
- P Utah State Parks and Recreation

### City/County/Local Governments

- P Uintah County Commissioner, Herb Snyder
- P Uintah County Commissioner, Lloyd Swain
- P Uintah County Commissioner, Cloyd Harrison
- P Uintah County Extension Agent
- P Uintah County Mosquito Abatement
- P Uintah County Road Department
- P Uintah Water Conservancy Dist
- P Vernal City Council, Allan Mashburn
- P Vernal City Council, Bert Clark
- P Vernal City Council, JoAnn Cowan
- P Vernal City Council, Matt Foley
- P Vernal City Council, Jim Abegglen
- P Vernal City Manager, Ken Bassett
- P Vernal Mayor, Bill Kremin

### Libraries

- P Uintah County Library
- P Duchesne County Library

## Organizations

- P Audubon Society, Gretchen Muller
- P Central Mountain & Plains Section The Wildlife Society, Fort Collins, CO
- P Cooperative Alliance for Refuge Enhancement (CARE), Washington, D.C.
- P Defenders of Wildlife, Washington, D.C.
- P Franson-Noble & Associates, Inc.
- P National Wildlife Refuge Association, Brent Giezentanner
- P Ouray Park Irrigation
- P Salt Lake City Audubon Society
- P Uintah Mountain Club
- P Uintah & Ouray Natural Resources, Jonas Grant
- P Ute Game and Fish, Bobby Chapoose; Karen Courts;
- P Vernal Jr. Hi Escape Club, Louise Murch

## Newspapers

- P Vernal Express
- P Uinta Basin Standard

## Schools/Universities

- P Utah State University, Dr. Rich Etchberger

## Individuals

- Batty, Joe
- Batty, Morgan
- Chapman, Nile
- Harbin, Chris
- Henry, Dale
- Johnson, Jim
- Maddox, Henry
- Peg's Café
- Schroeder, Rick
- Troester, Herb

## ***Appendix G.***

### ***List of Preparers***

This Plan was written by Dan Alonso, Refuge Manager; Manuel DeLeon, Wildlife Biologist; Dan Schaad, Refuge Operations Specialist; Jennifer DeLeon, Outdoor Recreation Planner; Allison Banks and Kelli Stone. Maps were prepared by Joanne Covas-Munro, Donna Vicars-Benjamin, and Jaymee Fojtik. Document editing and layout was prepared by Barbara Shupe.



# Appendix H.

## Species Lists of Ouray National Wildlife Refuge

Including birds, mammals, reptiles and amphibians, fish, and plants.  
(Behle and Perry 1975, Burt and Grossenheider 1976, Colorado River Fisheries Program, Conant 1975, Folks 1963, Goodrich and Neese 1986, Larson 1993, USFWS, Ouray [birds, mammals, reptiles and amphibians list])

### Birds (\*Indicates bird is a confirmed nester on the Refuge.)

#### Loons

Common Loon *Gavia immer*

#### Grebes

Pied-billed Grebe\* *Podilymbus podiceps*  
Horned Grebe *Podiceps auritus*  
Eared Grebe\* *Podiceps nigricollis*  
Western Grebe\* *Aechmophorus occidentalis*

#### Pelicans

American White Pelican *Pelecanus erythrorhynchos*

#### Cormorants

Double-crested Cormorant\* *Phalacrocorax auritus*

#### Bitterns, Herons, and Egrets

American Bittern *Botaurus lentiginosus*  
Least Bittern *Ixobrychus exilis*  
Great Blue Heron\* *Ardea herodias*  
Great Egret *Ardea alba*  
Snowy Egret\* *Egretta thula*  
Little Blue Heron *Egretta caerulea*  
Green Heron *Butorides virescens*  
Black-crowned Night-Heron\* *Nycticorax nycticorax*

#### Ibises and Spoonbills

White-faced Ibis\* *Plegadis chihi*

#### New World Vultures

Turkey Vulture\* *Cathartes aura*

#### Swans, Geese, and Ducks

Greater White-fronted Goose *Anser albifrons*  
Snow Goose *Chen caerulescens*  
Canada Goose\* *Branta canadensis*  
Trumpeter Swan *Cygnus buccinator*  
Tundra Swan *Cygnus columbianus*  
Wood Duck *Aix sponsa*  
Gadwall\* *Anas strepera*  
American Wigeon\* *Anas americana*  
Mallard\* *Anas platyrhynchos*  
Blue-winged Teal\* *Anas discors*  
Cinnamon Teal\* *Anas cyanoptera*  
Northern Shoveler\* *Anas clypeata*  
Northern Pintail\* *Anas acuta*  
Green-winged Teal\* *Anas crecca*  
Canvasback\* *Aythya valisineria*  
Redhead\* *Aythya americana*  
Ring-necked Duck *Aythya collaris*  
Greater Scaup *Aythya marila*  
Lesser Scaup *Aythya affinis*  
Bufflehead *Bucephala albeola*

Common Goldeneye  
 Barrow's Goldeneye  
 Hooded Merganser  
 Common Merganser\*  
 Red-breasted Merganser  
 Ruddy Duck\*

*Bucephala clangula*  
*Bucephala islandica*  
*Lophodytes cucullatus*  
*Mergus merganser*  
*Mergus serrator*  
*Oxyura jamaicensis*

***Osprey, Kites, Hawks, and Eagles***

Osprey  
 Bald Eagle  
 Northern Harrier\*  
 Sharp-shinned Hawk  
 Cooper's Hawk  
 Northern Goshawk  
 Swainson's Hawk\*  
 Red-tailed Hawk\*  
 Ferruginous Hawk  
 Rough-legged Hawk  
 Golden Eagle\*

*Pandion haliaetus*  
*Haliaeetus leucocephalus*  
*Circus cyaneus*  
*Accipiter striatus*  
*Accipiter cooperii*  
*Accipiter gentilis*  
*Buteo swainsoni*  
*Buteo jamaicensis*  
*Buteo regalis*  
*Buteo lagopus*  
*Aquila chrysaetos*

***Falcons and Caracaras***

American Kestrel\*  
 Merlin  
 Peregrine Falcon  
 Prairie Falcon\*

*Falco sparverius*  
*Falco columbarius*  
*Falco peregrinus*  
*Falco mexicanus*

***Gallinaceous Birds***

Ring-necked Pheasant\*  
 Sage Grouse

Introduced

*Phasianus colchicus*  
*Centrocercus urophasianus*

***Rails***

Virginia Rail\*  
 Sora\*  
 Common Moorhen  
 American Coot

*Rallus limicola*  
*Porzana carolina*  
*Gallinula chloropus*  
*Fulica americana*

***Cranes***

Sandhill Crane  
 Whooping Crane

*Grus canadensis*  
*Grus americana*

***Plovers***

American Golden-Plover  
 Snowy Plover  
 Semipalmated Plover  
 Killdeer\*

*Pluvialis dominica*  
*Charadrius alexandrinus*  
*Charadrius semipalmatus*  
*Charadrius vociferus*

***Stilts and Avocets***

Black-necked Stilt\*  
 American Avocet\*

*Himantopus mexicanus*  
*Recurvirostra americana*

***Sandpipers and Phalaropes***

Greater Yellowlegs  
 Lesser Yellowlegs  
 Solitary Sandpiper  
 Willet  
 Spotted Sandpiper\*  
 Long-billed Curlew\*  
 Marbled Godwit  
 Western Sandpiper  
 Least Sandpiper  
 Baird's Sandpiper  
 Dunlin  
 Short-billed Dowitcher  
 Long-billed Dowitcher  
 Common Snipe\*

*Tringa melanoleuca*  
*Tringa flavipes*  
*Tringa solitaria*  
*Catoptrophorus semipalmatus*  
*Actitis macularia*  
*Numenius americanus*  
*Limosa fedoa*  
*Calidris mauri*  
*Calidris minutilla*  
*Calidris bairdii*  
*Calidris alpina*  
*Limnodromus griseus*  
*Limnodromus scolopaceus*  
*Gallinago gallinago*

Wilson's Phalarope\*  
Red-necked Phalarope

*Phalaropus tricolor*  
*Phalaropus lobatus*

***Skuas, Jaegers, Gulls, and Terns***

Franklin's Gull  
Bonaparte's Gull  
Ring-billed Gull  
California Gull  
Herring Gull  
Caspian Tern  
Common Tern  
Forster's Tern\*  
Black Tern\*

*Larus pipixcan*  
*Larus philadelphia*  
*Larus delawarensis*  
*Larus californicus*  
*Larus argentatus*  
*Sterna caspia*  
*Sterna hirundo*  
*Sterna forsteri*  
*Chlidonias niger*

***Pigeons and Doves***

Rock Dove  
Band-tailed Pigeon  
Mourning Dove\*

Introduced

*Columba livia*  
*Columba fasciata*  
*Zenaidura macroura*

***Cuckoos and Anis***

Yellow-billed Cuckoo\*

*Coccyzus americanus*

***Typical Owls***

Western Screech-Owl  
Eastern Screech-Owl  
Great Horned Owl\*  
Burrowing Owl\*  
Long-eared Owl  
Short-eared Owl  
Northern Saw-whet Owl

*Otis kennicottii*  
*Otus asio*  
*Bubo virginianus*  
*Athene cunicularia*  
*Asio otus*  
*Asio flammeus*  
*Aegolius acadicus*

***Nightjars***

Common Nighthawk\*  
Common Poorwill

*Chordeiles minor*  
*Phalaenoptilus nuttallii*

***Swifts***

White-throated Swift

*Aeronautes saxatalis*

***Hummingbirds***

Black-chinned Hummingbird  
Broad-tailed Hummingbird  
Rufous Hummingbird

*Archilochus alexandri*  
*Selasphorus platycercus*  
*Selasphorus rufus*

***Kingfishers***

Belted Kingfisher

*Ceryle alcyon*

***Woodpeckers***

Lewis' Woodpecker\*  
Red-headed Woodpecker  
Yellow-bellied Sapsucker  
Downy Woodpecker\*  
Hairy Woodpecker\*  
Northern Flicker\*

*Melanerpes lewis*  
*Melanerpes erythrocephalus*  
*Sphyrapicus varius*  
*Picoides pubescens*  
*Picoides villosus*  
*Colaptes auratus*

***Tyrant Flycatchers***

Western Wood-Pewee  
Willow Flycatcher  
Say's Phoebe\*  
Vermilion Flycatcher  
Ash-throated Flycatcher  
Western Kingbird\*  
Eastern Kingbird

*Contopus sordidulus*  
*Empidonax traillii*  
*Sayornis saya*  
*Pyrocephalus rubinus*  
*Myiarchus cinerascens*  
*Tyrannus verticalis*  
*Tyrannus tyrannus*

**Shrikes**

Loggerhead Shrike\*  
Northern Shrike

*Lanius ludovicianus*  
*Lanius excubitor*

**Vireos**

Warbling Vireo\*

*Vireo gilvus*

**Crows, Jays, and Magpies**

Pinyon Jay  
Black-billed Magpie\*  
American Crow  
Common Raven

*Gymnorhinus cyanocephalus*  
*Pica pica*  
*Corvus brachyrhynchos*  
*Corvus corax*

**Larks**

Horned Lark\*

*Eremophila alpestris*

**Swallows**

Purple Martin  
Tree Swallow  
Violet-green Swallow  
Northern Rough-winged Swallow\*  
Bank Swallow  
Cliff Swallow\*  
Barn Swallow\*

*Progne subis*  
*Tachycineta bicolor*  
*Tachycineta thalassina*  
*Stelgidopteryx serripennis*  
*Riparia riparia*  
*Petrochelidon pyrrhonota*  
*Hirundo rustica*

**Titmice and Chickadees**

Black-capped Chickadee\*  
Mountain Chickadee

*Poecile atricapillus*  
*Poecile gambeli*

**Nuthatches**

Red-breasted Nuthatch  
White-breasted Nuthatch

*Sitta canadensis*  
*Sitta carolinensis*

**Creepers**

Brown Creeper

*Certhia americana*

**Wrens**

Rock Wren\*  
Bewick's Wren  
House Wren\*  
Marsh Wren\*

*Salpinctes obsoletus*  
*Thryomanes bewickii*  
*Troglodytes aedon*  
*Cistothorus palustris*

**Kinglets**

Golden-crowned Kinglet  
Ruby-crowned Kinglet

*Regulus satrapa*  
*Regulus calendula*

**Old World Warblers**

Blue-gray Gnatcatcher

*Polioptila caerulea*

**Thrushes**

Western Bluebird  
Mountain Bluebird  
Townsend's Solitaire  
Swainson's Thrush  
American Robin\*

*Sialia mexicana*  
*Sialia currucoides*  
*Myadestes townsendi*  
*Catharus ustulatus*  
*Turdus migratorius*

**Mimic Thrushes**

Gray Catbird  
Northern Mockingbird\*  
Sage Thrasher

*Dumetella carolinensis*  
*Mimus polyglottos*  
*Oreoscoptes montanus*

**Starlings**

European Starling\*

*Sturnus vulgaris*

**Wagtails and Pipits**

American (Water) Pipit

*Anthus rubescens***Waxwings**

Bohemian Waxwing

*Bombycilla garrulus*

Cedar Waxwing

*Bombycilla cedrorum***Wood Warblers**

Orange-crowned Warbler

*Vermivora celata*

Virginia's Warbler

*Vermivora virginiae*

Yellow Warbler\*

*Dendroica petechia*

Yellow-rumped Warbler

*Dendroica coronata*

Black-throated Gray Warbler

*Dendroica nigrescens*

Townsend's Warbler

*Dendroica townsendi*

American Redstart

*Setophaga ruticilla*

MacGillivray's Warbler

*Oporornis tolmiei*

Common Yellowthroat

*Geothlypis trichas*

Wilson's Warbler

*Wilsonia pusilla*

Yellow-breasted Chat\*

*Icteria virens***Sparrows and Towhees**

Green-tailed Towhee

*Pipilo chlorurus*

Spotted Towhee\*

*Pipilo maculatus*

American Tree Sparrow

*Spizella arborea*

Brewer's Sparrow

*Spizella breweri*

Vesper Sparrow

*Poocetes gramineus*

Lark Sparrow

*Chondestes grammacus*

Sage Sparrow

*Amphispiza belli*

Lark Bunting

*Calamospiza melanocorys*

Savannah Sparrow

*Passerculus sandwichensis*

Fox Sparrow

*Passerella iliaca*

Song Sparrow

*Melospiza melodia*

Lincoln's Sparrow

*Melospiza lincolni*

White-throated Sparrow

*Zonotrichia albicollis*

Harris' Sparrow

*Zonotrichia querula*

White-crowned Sparrow

*Zonotrichia leucophrys*

Dark-eyed Junco

*Junco hyemalis*

Snow Bunting

*Plectrophenax nivalis***Cardinals, Grosbeaks, and Allies**

Black-headed Grosbeak

*Pheucticus melanocephalus*

Blue Grosbeak

*Guiraca caerulea*

Lazuli Bunting

*Passerina amoena***Blackbirds and Orioles**

Red-winged Blackbird\*

*Agelaius phoeniceus*

Western Meadowlark\*

*Sturnella neglecta*

Yellow-headed Blackbird\*

*Xanthocephalus xanthocephalus*

Brewer's Blackbird\*

*Euphagus cyanocephalus*

Common Grackle

*Quiscalus quiscula*

Brown-headed Cowbird\*

*Molothrus ater*

Baltimore Oriole

*Icterus galbula***Finches**

House Finch

*Carpodacus mexicanus*

Pine Siskin

*Carduelis pinus*

Lesser Goldfinch

*Carduelis psaltria*

American Goldfinch\*

*Carduelis tristis*

Evening Grosbeak

*Coccothraustes vespertinus*

Rosy Finch

*Leucosticte arctoa***Old World Sparrows**

House Sparrow\*

Introduced

*Passer domesticus*

<b>Mammals</b>		
<b>Bears</b>	Black Bear	<i>Ursus americanus</i>
<b>Raccoons</b>	Raccoon	<i>Procyon lotor</i>
<b>Otters, Badgers, and Skunks</b>	Northern River Otter	<i>Lutra canadensis</i>
	American Badger	<i>Taxidea taxus</i>
	Striped Skunk	<i>Mephitis mephitis</i>
<b>Dogs and Foxes</b>	Coyote	<i>Canis latrans</i>
	Red Fox	<i>Vulpes vulpes</i>
	Kit Fox	<i>Vulpes macrotis</i>
<b>Cats</b>	Mountain Lion	<i>Felis concolor</i>
	Lynx	<i>Lynx canadensis</i>
	Bobcat	<i>Lynx rufus</i>
<b>Squirrels</b>	Yellow-bellied Marmot	<i>Marmota flaviventris</i>
	White-tailed Prairie Dog	<i>Cynomys leucurus</i>
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
	Least Chipmunk	<i>Tamias minimus</i>
<b>Kangaroo Rat</b>	Ord's Kangaroo Rat	<i>Dipodimys ordii</i>
<b>Beaver</b>	American Beaver	<i>Castor canadensis</i>
<b>Mice</b>	Deer Mouse	<i>Peromyscus maniculatis</i>
	White-footed Mouse	<i>Peromyscus leucopus</i>
<b>Vole</b>	Meadow Vole	<i>Microtus pennsylvanicus</i>
<b>Muskrat</b>	Muskrat	<i>Ondatra zibethicus</i>
<b>Porcupine</b>	Porcupine	<i>Erithizon dorsatum</i>
<b>Hares and Rabbits</b>	White-tailed Jackrabbit	<i>Lepus townsendii</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>
	Desert Cottontail	<i>Sylvilagus audubonii</i>
<b>Deer</b>	American Elk	<i>Cervus elaphus</i>
	Mule Deer	<i>Odocoileus hemionus</i>
	Moose	<i>Alces alces</i>
<b>Pronghorn</b>	Pronghorn	<i>Antilocapra americana</i>
<b>Bison</b>	American Bison	<i>Bos bison</i>

**Reptiles and Amphibians:****Reptiles:**

<b>Fence Lizard</b>	Eastern Fence Lizard	<i>Sceloporus undulatus</i>
<b>Side-Blotched Lizard</b>	Side-blotched Lizard	<i>Uta stansburiana</i>
<b>Horned Lizard</b>	Short-horned Lizard	<i>Phrynosoma douglassii</i>
<b>Whiptail</b>	Western Whiptail	<i>Cnemidophorus tigris</i>
<b>Garter Snake</b>	Wandering Garter Snake	<i>Thamnophis elegans vagrans</i>
<b>Racer</b>	Yellow-bellied Racer	<i>Coluber constrictor</i>
<b>Green Snake</b>	Smooth Green Snake	<i>Opheodrys vernalis</i>
<b>Gopher Snake</b>	Great Basin Gopher Snake	<i>Pituophis melanoleucus</i>
<b>Rattlesnake</b>	Western Rattlesnake	<i>Crotalus viridis</i>

**Amphibians:**

<b>Toads</b>	Woodhouse's Toad	<i>Bufo woodhousei</i>
	Rocky Mountain Toad	<i>Bufo woodhousei woodhousei</i>
<b>Chorus Frog</b>	Boreal Chorus Frog	<i>Pseudacris triseriata maculata</i>
<b>Leopard Frog</b>	Northern Leopard Frog	<i>Rana pipiens</i>

**Fish:**

<b>Trouts</b>	Rainbow Trout*	<i>Oncorhynchus mykiss</i>
	Brown Trout*	<i>Salmo trutta</i>
<b>Pikes</b>	Northern Pike*	<i>Esox lucius</i>
<b>Carps and Minnows</b>	Common Carp*	<i>Cyprinus carpio</i>
	Utah Chub*	<i>Gila atraria</i>
	Roundtail Chub	<i>Gila robusta</i>
	Bonytail	<i>Gila elegans</i>
	Humpback Chub	<i>Gila cypha</i>
	Sand Shiner*	<i>Notropis stramineus</i>
	Fathead Minnow*	<i>Pimephales promelas</i>
	Colorado Pikeminnow	<i>Ptychocheilus lucius</i>
	Speckled Dace	<i>Rhinichthys osculus</i>
	Redside Shiner*	<i>Richardsonius balteatus</i>
	Red Shiner*	<i>Notropis lutrensis</i>
<b>Suckers</b>	White Sucker*	<i>Catostomus commersoni</i>
	Bluehead Sucker	<i>Catostomus discobolus</i>
	Flannelmouth Sucker	<i>Catostomus latipinnis</i>
	Razorback Sucker	<i>Xyrauchen texanus</i>
<b>Bullhead Catfishes</b>	Black Bullhead*	<i>Ictalurus melas</i>
	Channel Catfish*	<i>Ictalurus punctatus</i>
<b>Livebearers</b>	Mosquitofish*	<i>Gambusia affinis</i>
<b>Sunfishes</b>	Green Sunfish*	<i>Lepomis cyanellus</i>
	Bluegill*	<i>Lepomis macrochirus</i>
	Smallmouth Bass*	<i>Micropterus dolomieu</i>
	Black Crappie*	<i>Pomoxis nigromaculatus</i>
<b>Perches</b>	Yellow Perch*	<i>Perca flavescens</i>
	Walleye	<i>Stizostedion vitreum vitreum</i>
<b>Sculpins</b>	Mottled Sculpin	<i>Cottus bairdi</i>
<b>Sticklebacks</b>	Brook stickleback	<i>Culaea inconstans</i>

\*Indicates species is not native to this area.

**Plant Species:****Grasses**

Crested Wheatgrass	<i>Agropyron cristatum</i>
Western Wheatgrass	<i>Agropyron smithii</i>
Slender Wheatgrass	<i>Agropyron trachycaulum</i>
Creeping Bentgrass	<i>Agrostis stolonifera</i>
Purple Three-awn	<i>Aristida purpurea</i>
American Sloughgrass	<i>Beckmannia syzigachne</i>
Cheatgrass	<i>Bromus tectorum</i>
Inland Saltgrass	<i>Distichlis spicata</i>
Barnyard Grass	<i>Echinochloa crusgalli</i>
Nodding Wildrye	<i>Elymus canadensis</i>
Low Creeping Wildrye	<i>Elymus simplex</i>
Sixweeks Fescue	<i>Festuca octoflora</i>
Galleta	<i>Hilaria jamesii</i>
Foxtail Barley	<i>Hordeum jubatum</i>
Scratchgrass	<i>Muhlenbergia asperifolia</i>
Indian Ricegrass	<i>Oryzopsis hymenoides</i>
Old Witchgrass	<i>Panicum capillare</i>
Common Reed	<i>Phragmites australis</i>
Sandberg Bluegrass	<i>Poa secunda</i>
Rabbitfoot Grass	<i>Polypogon monspeliensis</i>
Squirreltail	<i>Sitanion hystrix</i>
Alkali Sacaton	<i>Sporobolus airoides</i>
Sand Dropseed	<i>Sporobolus cryptandrus</i>
Needle-and-Thread Grass	<i>Stipa comata</i>

**Forbs and Weeds**

Lowland Purslane	<i>Sesuvium sessile</i>
Redroot Amaranth	<i>Amaranthus retroflexus</i>
Springparsley	<i>Cymopterus acaulis</i>
Onion Springparsley	<i>Cymopterus bulbosus</i>
Uintah Basin Springparsley	<i>Cymopterus duchesnensis</i>
Purple Springparsley	<i>Cymopterus purpurascens</i>
Hemp Dogbane	<i>Apocynum cannabinum</i>
Pallid Milkweed	<i>Asclepias cryptoceras</i>
Labriform Milkweed	<i>Asclepias labriformis</i>
Showy Milkweed	<i>Asclepias speciosa</i>
Bur Ragweed	<i>Ambrosia tomentosa</i>
Leafy Aster	<i>Aster frondosus</i>
Nodding Beggarticks	<i>Bidens cernua</i>
Russian Knapweed	<i>Centaurea repens</i>
Douglas Chaenactis	<i>Chaenactis douglasii</i>
False Yarrow	<i>Chaenactis stevioides</i>
Creeping Thistle	<i>Cirsium arvense</i>
Bull Thistle	<i>Cirsium vulgare</i>
Dandelion Hawksbeard	<i>Crepis runcinata glauca</i>
Enceliopsis	<i>Enceliopsis nutans</i>
Fleabane	<i>Erigeron bellidiastrum typicus</i>
Low Fleabane	<i>Erigeron pumilus</i>
Lowland Cudweed	<i>Gnaphalium palustre</i>
Curlycup Gumweed	<i>Grindelia squarrosa</i>
Broom Snakeweed	<i>Gutierrezia sarothrae</i>
Orange Sneezeweed	<i>Helenium autumnale</i>
Wild Sunflower	<i>Helianthus annuus</i>
Sunflower	<i>Helianthus petiolaris</i>
Showy Goldeneye	<i>Heliomeris multiflora</i>
Fineleaf Hymenopappus	<i>Hymenopappus filifolius luteus</i>
Poverty Sumpweed	<i>Iva axillaris</i>
Chicory Lettuce	<i>Lactuca tatarica</i>
Heath Aster	<i>Leucelene ericoides</i>
Skeleton Plant	<i>Lygodesmia grandiflora</i>
Purple Aster	<i>Machaeranthera canescens</i>
Discoid Tansyaster	<i>Machaeranthera grindelioides</i>



Desert Dandelion

Canada Goldenrod  
Missouri Goldenrod  
Western Goldenrod  
Field Sowthistle  
Prickly Sowthistle  
Wirelettuce  
Wirelettuce  
Nuttall Horsebrush  
Cottonthorn Horsebrush  
Townsendia  
Townsendia  
Yellow Salsify  
Rough Cocklebur  
Desert Daisy  
Cryptantha  
Yellow Cryptantha  
Cryptantha  
Desert Stickseed  
Persoon  
Beauty Rockcress  
Rough Wallflower  
Prairie Pepperweed  
Giant Whitetop  
Mountain Pepperweed  
African Mustard  
Common Twinpod  
Blunt-leaf Yellowcress  
Marsh Yellowcress  
Cress  
Flaxleafed Plainsmustard  
Tall Tumble Mustard

Yellow Bee-plant  
Rocky Mountain Bee-plant  
Fendler Sandwort

Fremont Goosefoot  
Oakleaf Goosefoot  
Green Molly  
Kochia Weed  
Povertyweed  
Russian Thistle  
Halogeton  
Field Bindweed  
Dodder  
Spurge  
Fendler Euphorbia  
Locoweed  
Cicada Milkvetch  
Lesser Rushy Milkvetch  
Duchesne Milkvetch  
Yellow Milkvetch  
Geyer Milkvetch

Woolly Locoweed  
Draba Milkvetch  
American Wild Licorice  
Dwarf Lupine  
Yellow Sweetclover  
Silvery Sophora  
Tall Centaury

*Malacothrix sonchoides*  
*Platyschukhria integrifolia*  
*Prenanthes exigu*  
*Solidago canadensis*  
*Solidago missouriensis*  
*Solidago occidentalis*  
*Sonchus arvensis*  
*Sonchus asper*  
*Stephanomeria pauciflora*  
*Stephanomeria runcinata*  
*Tetradymia nuttallii*  
*Tetradymia spinosa*  
*Townsendia grandiflora*  
*Townsendia incana*  
*Tragopogon dubius*  
*Xanthium strumarium*  
*Xylorhiza venusta*  
*Cryptantha ambigua*  
*Cryptantha flava*  
*Cryptantha paradoxa*  
*Lappula redowskii*  
*Tiquilia nuttallii*  
*Arabis pulchra*  
*Erysimum asperum*  
*Lepidium densiflorum*  
*Lepidium latifolium*  
*Lepidium montanum*  
*Malcolmia africana*  
*Physaria acutifolia*  
*Rorippa curvipes*  
*Rorippa islandica*  
*Rorippa lyrata*  
*Schoenocrambe linifolia*  
*Sisymbrium altissimum*  
*Thelypodopsis elegans*  
*Cleome lutea*  
*Cleome serrulata*  
*Arenaria fendleri eastwoodiae*  
*Chenopodium atrovirens*  
*Chenopodium fremontii*  
*Chenopodium glaucum*  
*Kochia americana*  
*Kochia scoparia*  
*Monolepis nuttalliana*  
*Salsola iberica*  
*Halogeton glomeratus*  
*Convolvulus arvensis*  
*Cuscuta spp.*  
*Euphorbia albomarginata*  
*Euphorbia fendleri*  
*Astragalus amphioxys*  
*Astragalus chamaeleuce*  
*Astragalus convallarius*  
*Astragalus duchesnensis*  
*Astragalus flavus*  
*Astragalus geyeri*  
*Astragalus hamiltonii*  
*Astragalus mollissimus*  
*Astragalus spatulatus*  
*Glycyrrhiza lepidota*  
*Lupinus pusillus*  
*Melilotus officinalis*  
*Sophora stenophylla*  
*Mentaurium exaltatum*  
*Nama densum*

Scorpionweed	<i>Phacelia crenulata</i>
Scorpionweed	<i>Phacelia ivesiana</i>
Geyer Onion	<i>Allium geyeri</i>
Wild Onion	<i>Allium textile</i>
Asparagus	<i>Asparagus officinalis</i>
Sego Lily	<i>Calochortus nuttallii</i>
False Solomon's Seal	<i>Smilacina stellata</i>
Whitestem Mentzelia	<i>Mentzelia albicaulis</i>
Brushy Mentzelia	<i>Mentzelia dispersa</i>
Wingseed Mentzelia	<i>Mentzelia pterosperma</i>
Purple Ammannia	<i>Ammannia robusta</i>
Alkali-mallow	<i>Malvella leprosa</i>
Scarlet Globemallow	<i>Sphaeralcea coccinea</i>
Nelson Globemallow	<i>Sphaeralcea parvifolia</i>
Sandverbena	<i>Abronia elliptica</i>
Narrowleaf Umbrellawort	<i>Mirabilis linearis</i>
	<i>Tripterocalyx micranthus</i>
Barestem Camissonia	<i>Camissonia scapoidea</i>
Small-flowered Gaura	<i>Gaura parviflora</i>
Tufted Evening-primrose	<i>Oenothera caespitosa</i>
Evening-primrose	<i>Oenothera elata</i>
Pale Evening-primrose	<i>Oenothera pallida</i>
Plantain	<i>Plantago asiatica</i>
Broadleaf Plantain	<i>Plantago major</i>
Woolly Plantain	<i>Plantago patagonica</i>
Ballhead Gilia	<i>Gilia congesta</i>
Gilia	<i>Gilia leptomeria</i>
Gilia	<i>Gilia polycladon</i>
Dwarf Gilia	<i>Gilia pumila</i>
Common Prickly Phlox	<i>Lepodactylon pungens</i>
Hood Phlox	<i>Phlox hoodii</i>
Wild Sweet William	<i>Phlox longifolia</i>
	<i>Eriogonum batemanii</i>
	<i>Nodding Eriogonum</i>
	<i>Eriogonum cernuum</i>
Big Wild Buckwheat	<i>Eriogonum corymbosum</i>
	<i>Eriogonum flexum</i>
Gordon's Umbrella Plant	<i>Eriogonum gordonii</i>
	<i>Eriogonum hookeri</i>
Desert Trumpet Eriogonum	<i>Eriogonum inflatum</i>
Slenderbush Eriogonum	<i>Eriogonum microthecum</i>
	<i>Eriogonum salsuginosum</i>
Shockley Wild Buckwheat	<i>Eriogonum shockleyi</i>
Green Eriogonum	<i>Eriogonum viridulum</i>
Western Virgin-bower	<i>Clematis ligusticifolia</i>
Nuttall Larkspur	<i>Delphinium nuttallianum</i>
Biennial Cinquefoil	<i>Potentilla biennis</i>
Brook Cinquefoil	<i>Potentilla rivalis</i>
Desert Paintbrush	<i>Castilleja chromosa</i>
Marsh Paintbrush	<i>Castilleja exilis</i>
Black Nightshade	<i>Solanum nigrum</i>
Prostrate Verbena	<i>Verbena bracteata</i>

***Aquatic and Wetland Plants***

Narrowleaf Water-plantain  
Bur-head  
Upright Burhead  
Arrowhead  
Salt Heliotrope  
Saltmarsh Sandspurry

Awne d Flatsedge  
Needle Spikerush  
Common Spikerush  
Dwarf Spikerush  
Hardstem Bulrush  
Alkali Bulrush  
Bulrush  
Softstem Bulrush  
Smooth Scouring-rush  
Alpine Rush  
Wiregrass  
Toad Rush  
Torrey Rush  
Marsh Hedgenettle  
Water Smartweed  
Dooryard-grass  
Pale Smartweed  
Curly Dock  
Canaigre  
Golden Dock  
Bitter Dock  
Western Dock  
Longleaf Pondweed  
Sago Pondweed  
Hairleaf Water-buttercup  
Rocky Mtn. Buttercup  
Pennsylvania Buttercup  
Meadowrue  
Hedge Hyssop  
Mudwort  
Water Speedwell  
Common Cattail  
Fogfruit

*Alisma gramineum*  
*Echinodorus berteroi*  
*Echinodorus rostratus*  
*Sagittaria cuneata*  
*Heliotropium curassavicum*  
*Spergularia marina*  
*Chara spp*  
*Cyperus aristatus*  
*Eleocharis acicularis*  
*Eleocharis palustris*  
*Eleocharis parvula*  
*Scirpus acutus*  
*Scirpus maritimus*  
*Scirpus saximontanus*  
*Scirpus validus*  
*Equisetum laevigatum*  
*Juncus alpinus*  
*Juncus arcticus*  
*Juncus bufonius*  
*Juncus torreyi*  
*Stachys palustris pilosa*  
*Polygonum amphibium*  
*Polygonum aviculare*  
*Polygonum lapathifolium*  
*Rumex crispus*  
*Rumex hymenosepalus*  
*Rumex maritimus*  
*Rumex obtusifolius*  
*Rumex occidentalis*  
*Potamogeton nodosus*  
*Potamogeton pectinatus*  
*Ranunculus aquatilis*  
*Ranunculus cymbalaria*  
*Ranunculus pennsylvanicus*  
*Thalictrum spp*  
*Gratiola neglecta*  
*Limosella aquatica*  
*Veronica anagallis-aquatica*  
*Typha latifolia*  
*Phyla cuneifolia*

**Woody Plants**

Squaw Bush  
Biennial Wormwood  
Tarragon  
Prairie Sage

Black Sagebrush  
Bud Sagebrush  
Big Sagebrush  
Mohave Brickellbush  
Rubber Rabbitbrush  
Low Rabbitbrush  
Silverscale  
Fourwing Saltbush  
Shadscale  
Mat Saltbush  
Castle Valley Saltbush

Fivehook Bassia  
Winterfat  
Spiny Hopsage  
Black Greasewood  
Russian-olive  
Silver Buffaloberry  
Torrey Mormon Tea  
Woods Rose  
Fremont Cottonwood  
Peach-leaf Willow  
Narrow-leaf Willow  
Whiplash Willow  
Tamarisk

**Cactus**

Ball Cactus  
Plains Pricklypear  
Uintah Basin Hookless Cactus

*Rhus trilobata*  
*Artemisia biennis*  
*Artemisia dracunculoides*  
*Artemisia ludoviciana*  
*var. ludoviciana*  
*Artemisia nova*  
*Artemisia spinescens*  
*Artemisia tridentata*  
*Brickellia oblongifolia*  
*Chrysothamnus nauseosus*  
*Chrysothamnus viscidiflorus*  
*Atriplex argentea*  
*Atriplex canescens*  
*Atriplex confertifolia*  
*Atriplex corrugata*  
*Atriplex gardneri cuneata*  
*Atriplex heterosperma*  
*Bassia hyssopifolia*  
*Ceratoides lanata*  
*Grayia spinosa*  
*Sarcobatus vermiculatus*  
*Elaeagnus angustifolia*  
*Shepherdia argentea*  
*Ephedra torreyana*  
*Rosa woodsii*  
*Populus fremontii*  
*Salix amygdaloides*  
*Salix exigua*  
*Salix lasiandra*  
*Tamarix ramosissima*

*Coryphantha vivipara*  
*Opuntia polyacantha*  
*Sclerocactus glaucus*

# ***Appendix I.***

## ***Environmental Assessment***

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### Purpose

Ouray National Wildlife Refuge, located in Uintah County in northeastern Utah, was established in 1960. It is one of more than 500 refuges in the National Wildlife Refuge System managed by the U.S. Fish and Wildlife Service. The Refuge was originally established as a waterfowl production area and as a resting and feeding area for migratory birds traveling along the Green River corridor.

Human demands on water resources in western states have resulted in loss, alteration, and degradation of riparian habitats, and the species dependent on such river systems have declined. The importance of these riverine, riparian, and seasonal wetland habitats has since been recognized, and the Refuge's role in protecting these areas and the wildlife dependent upon them has become more critical.

Purposes for management activities on the Refuge include providing high quality riparian woodland and bottomland wetland habitats for migratory passerine birds and native fish species of the Upper Colorado River Basin, diversification and enhancement of seasonal wetlands that provide nesting habitat for colonial waterbirds and feeding areas for shorebirds, and providing educational and recreational opportunities for the public.

### Need for Action

Management needs on the Refuge include: the need to restore degraded riparian and wetland habitats, to assist in the recovery of endangered fish species of the Colorado River, to control spreading nonnative plants, to reduce deposition and concentration of selenium in Refuge bottoms, to resolve conflicts over Refuge mosquito production, and to enhance recreational and educational opportunities for the visiting public.

The Refuge System Improvement Act of 1996 (as amended) requires Comprehensive Conservation Plans (CCP) to be prepared for each refuge by 2015. The CCP is needed to address "...significant problems that may adversely affect the populations and habitats of fish, wildlife, and plants and the actions necessary to correct or mitigate such problems." The CCP will also describe the future management direction of the Refuge, and the desired condition of wildlife habitat. The CCP is needed to bring the Refuge in line with the new National Wildlife Refuge System mission, goals, and policies.

## Description of Alternatives

Three potential management directions (Alternatives) that the Refuge could follow for the next 15 years were identified by the planning team. Each Alternative would address Refuge issues, opportunities, and goals in a different manner. A description of each Alternative and how each would address Refuge goals follows:

- \* *Alternative 1. No Action.* The Refuge would basically follow the current management direction.
- \* *Alternative 2. Implement the Ouray NWR CCP.* Objectives and action items proposed by this Plan are described in this alternative. Basically, more emphasis would be placed on restoring River bottom woodlands and riparian wetlands to a more productive and natural condition to support migratory birds and endangered fish species of the Green River.

Implementation of the Plan within the next 15 years would require additional agency funding for specific objectives, two additional permanent employees, as well as partnerships with other Federal land management agencies, the Ute Tribe, State and local government, private conservation organizations, and local landowners. Refer to the Refuge Goals, Objectives, and Strategies sections of the CCP for a detailed description of the proposed actions.

- \* *Alternative 3. Release Refuge Habitats to the Direct Influence of the Green River.* Refuge levees would be breached to give the River control of floodplain habitats. Refuge facilities within the floodplain would be relocated or abandoned.

### Alternative 1. No Action.

Current management activities will continue as planned prior to the first levee modification in 1996. Impoundments would be maintained through pumping and diverting water from the Green River and Pelican Lake Pipeline. Enhancement of riparian plant communities for migratory bird habitat would not be a priority. Levees would be maintained to control flooding from the River. Levees modified under the RIP would be restored approximately to their original condition. Limited control of invasive nonnative plants would continue. Limited control of mosquitos by use of BTI would continue at the current level. The diversity of wetland types would remain the same with few shallow water emergent wetlands being available.

The Refuge would continue to assist in the recovery of Colorado River fishes by providing a site and support for the Ouray National Fish Hatchery. Levee modifications would be regarded as experimental and would occur on a limited basis. Bottomland wetlands not included in the experimental levee project would not be exposed to seasonal River flooding, and no new habitat that supports Colorado River fishes would be developed.

Population monitoring for the Uintah hookless cactus would continue at the current level. The Refuge would provide winter roosting habitat for the bald eagle in remnant riparian woodlands and migration feeding habitat for the peregrine falcon.

To provide high energy food for migrating waterfowl and waterbirds, a Refuge cooperator would plant 150 acres of alfalfa, small grains, and row crops in Sheppard Bottom. Upland grassland and desert habitats would be maintained in the same condition as present. Livestock and wild horses would continue to be excluded. Refuge fences currently restrict the movement of pronghorn and would continue to do so. No active management program for uplands or grassland birds would be developed.

Selenium contaminated water in the Roadside Draw would be diverted into other areas to speed up evaporation and plant growth and to reduce the open water attraction to waterbirds. The Refuge is considering channeling water from the Roadside Draw directly to the River bypassing Sheppard Bottom. However, feasibility, surveying, and technical information is still being analyzed, and no decision has been made. The Refuge would continue to cooperate with other local agencies and interest groups attempting to manage selenium.

Public use, education, and interpretation programs would continue much as they do currently. Year round use of the auto tour route and observation tower would continue, with wildlife observation and photography being the main purpose for visits from the public. Hunting for mule deer, waterfowl, and ring-necked pheasants and fishing for channel catfish in the Green River would also continue. Public use facilities that currently exist would not be expanded except for routine maintenance. This includes an information kiosk, picnic area, parking lots for hunters, anglers, and hikers, the auto tour and tower. The tour route displays would not be revised to reflect changes in the landscape and management practices.

No new walking trails, tour routes, and facilities would be developed. Minor revisions to Refuge leaflets and brochures would be made as necessary. Staff participation in community events and educational programs would be determined by time and funding at the current level. Cultural and paleontological resources would continue to receive protection at the current level. Construction sites are surveyed for artifacts before disturbance. Known sites are protected from human disturbance.

## Alternative 2. Implement the Ouray NWR CCP

This alternative implements the CCP. Objectives would be accomplished in 15 years unless otherwise stated. Actual implementation of objectives and strategies may differ from the proposals because of funding and staff limitations.

To better achieve its mission of providing habitat for migratory birds, Ouray NWR is changing existing management goals. Many of the objectives and strategies in the proposed CCP call for research and data gathering, as information on habitat conditions and ecological functioning prior to the operation of Flaming Gorge Dam and other major modifications in the Green River has not been gathered. Information about similar habitats along other river corridors exists, but the relationships and requirements of migratory birds using this section of the Green River has not been well defined. Much of this work can be accomplished fairly quickly making use of data already in existence. Specific habitat management proposals can be more clearly defined and implemented in the step-down Habitat Management Plan.

### Alternative 3. Release Refuge Habitats to the Direct Influence of the Green River

Under this alternative, Refuge levees on the Green River would be breached, allowing the River to reclaim all habitats within the historic floodplain (see Map 9, 10, and 11). The Refuge would remove or abandon remaining dikes, structures, or roads in this area. No active management of riparian communities, bottomlands, moist soil, or other shallow wetlands would take place, though wildlife and plant community responses to the new River-dependent habitats would be monitored and recorded. Nonnative plants would be controlled if feasible, or where access is still possible. Monitoring of mosquito production and limited control efforts would continue.

Ouray National Fish Hatchery would need structural modifications and protective levees to withstand changes in River flows. Proposed levee modifications would not take place, and the availability of habitats for endangered fish would be dependent on the River.

Roads and other Refuge facilities would need to be relocated to upland areas and would be placed to avoid impacts to colonies of the Uintah Basin hookless cactus. Population monitoring of special status species would continue on a regular basis. Wetland habitats and availability of prey for the bald eagle and peregrine falcon would be dependent on the River; no active manipulations in this area would take place.

Cooperative farming on the Refuge may not occur, depending on how much of the existing farmed fields are flooded. Production of grain crops for migratory birds would be very limited, unless fields were relocated to higher ground.

More emphasis on management of remaining uplands would take place. Control of nonnative plants would increase, and more investigation into maintaining the vigor and health of Refuge grasslands and desert uplands would occur. The proposed inventory and monitoring plans for grassland birds and vegetation would be developed. To allow passage for pronghorn, Refuge fences would be modified.

The Refuge's ability to actively reduce selenium concentration in wetlands would be limited by access and water levels reestablished by the River. However, with more water flushing through the floodplain, selenium may be diluted to the point it is not a hazard to birds.

Road and trail access to Refuge wetland and riparian areas would not be developed. Access on existing trails would be available depending on the year or season. Hunting, fishing, and wildlife observation would continue to be permitted in safe areas. Given a suitable location, an upland nature trail with overlooks onto the floodplain would be developed. Interpretation of wetland and River would occur from upland sites. Portions of the existing auto tour route would be closed or rerouted depending on River conditions. All construction areas in the uplands would be surveyed for cultural resources or new paleontological sites. Such resources would be interpreted for Refuge visitors and information incorporated into educational materials.

Refuge brochures and information kiosks would need modifications to describe changes in access and facilities. Interpretive information would be revised to explain the new management approach and how the River would affect Refuge habitats. Refuge visitors would experience the floodplain and wetland habitats of the area from a distance rather than traveling directly through them. Refuge staff would continue to participate in community events, visiting schools, and offering interpretive programs to interested groups.



# Ouray National Wildlife Refuge Green River Low Flow Flooded Bottomland Study

## LEGEND

- Green River Water Extent at 20,000 cfs - 05/18/96
- Private Lands
- Ouray NWR Boundary

Frequency	Wetland Vegetation Type	Vegetation Subject to Flooding
121	FORESTED	235.078
180	SCRUB-SHRUB	241.061
125	EMERGENT	1218.908
107	SAND/BAR	968.166
53	OPEN WATER	1306.673
334	UPLAND	322.246

Map Location

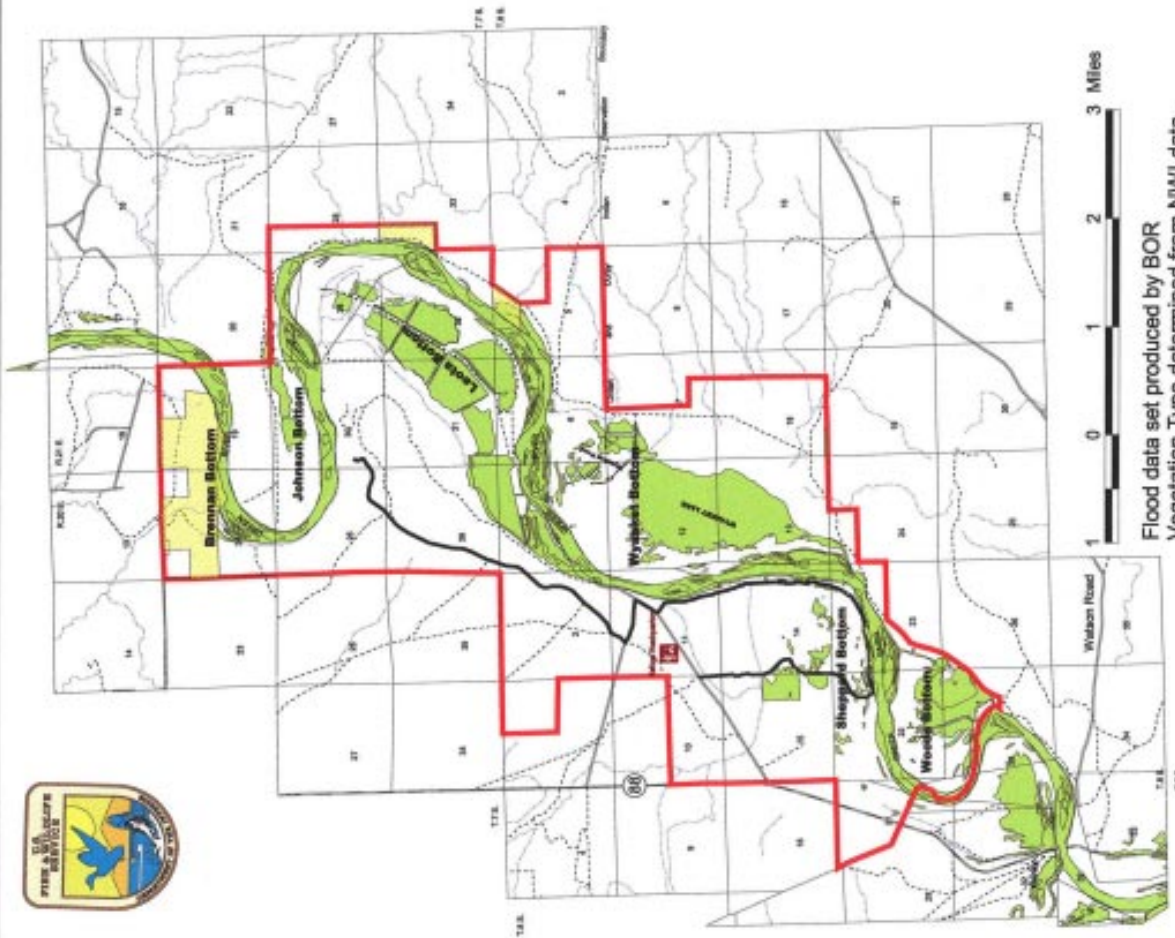


State of Utah



Map # 9

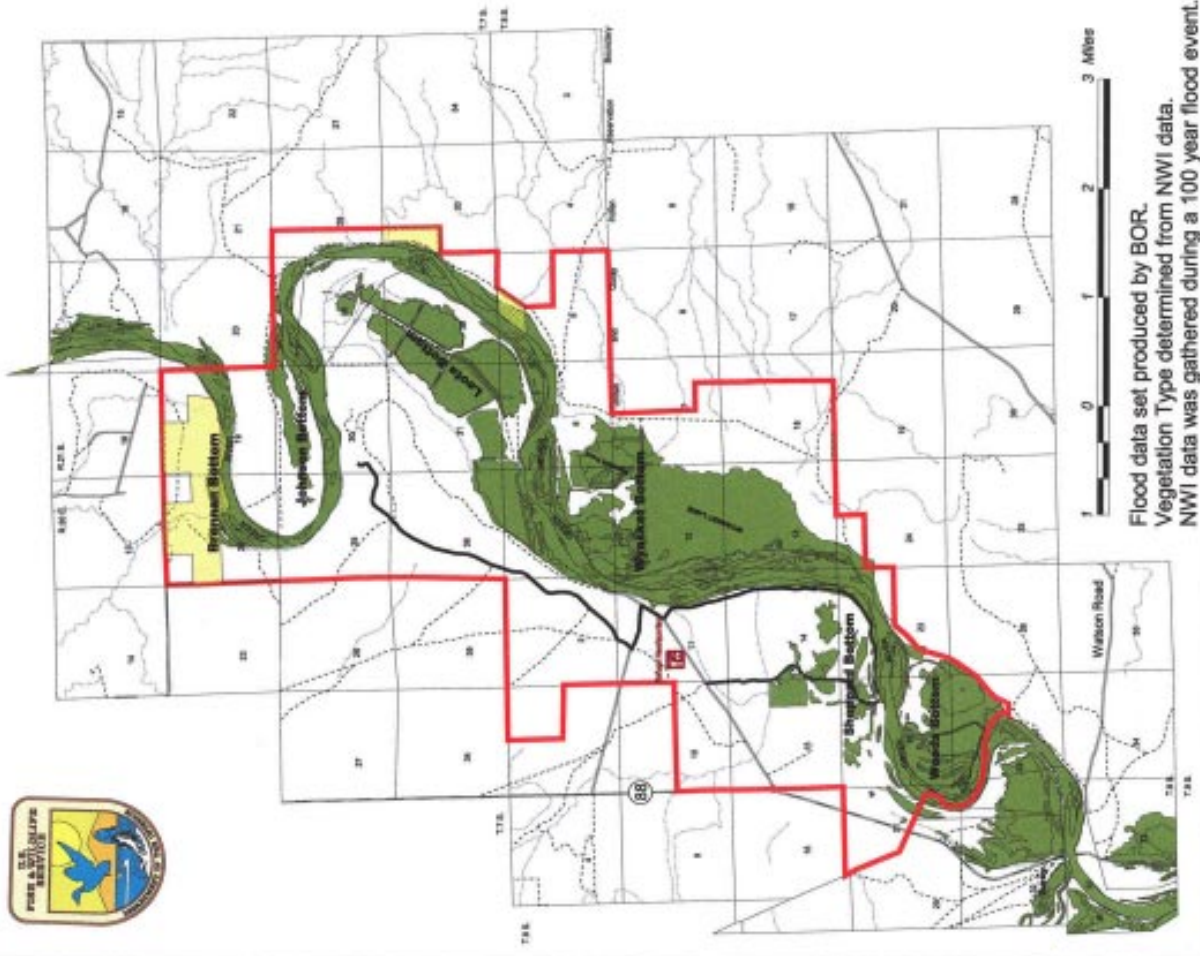
**DRAFT**



Flood data set produced by BOR  
Vegetation Type determined from NWI data.  
NWI data was gathered during a 100 year flood event.



# Ouray National Wildlife Refuge Green River Medium Flow Flooded Bottomland Study





Flood data set produced by BOR  
Vegetation Type determined from NWI data.  
NWI data was gathered during a 100 year flood event.

Green River Water Extent at 24,870 cfs - 06/05/97

Private Lands

Ouray NWR Boundary

Frequency	retard- vegetation Type	Vegetative index to flooding
135	FORESTED	448.559
137	SCRUB-SCRUB	643.455
109	EMERGENT	1881.967
129	SAND/BAR	1306.270
51	OPEN WATER	1451.554
278	UPLAND	2605.035

Map # 11

DRAFT





## Affected Environment

The affected environment is described in the Resources and Refuge Description sections of the CCP.

## Environmental Consequences

This chapter evaluates the three alternatives on the basis of consequences or impacts to the environment. Alternative 1, "No Action," is the *status quo* alternative where current conditions and trends of management, public use, and land-use and ownership are projected into the foreseeable future. Alternative 2 implements the CCP. Analysis of Alternative 2 focuses on anticipated environmental change in comparison to conditions remaining under Alternative 1. Alternative 3 proposes a conversion to as completely a natural system as possible under current River conditions.

### A. Impacts to the Biological Environment

*Alternative 1* would result in no substantial changes in wildlife populations, habitat quality, or biodiversity as it currently exists. Management strategies would continue as they are currently designed. Information on historical riparian plant communities and how to recreate them would be integrated into management plans in a limited manner. Refuge wetland habitats would continue to support those species that prefer semipermanent, deep water wetlands with robust emergent vegetation (primarily cattail and bulrush). Habitat quality and biological diversity of the area would probably decline slowly as a result of continuing degradation of the riparian corridor and invasion of nonnative plants.

Repair and maintenance of fences to exclude livestock would only occur on a limited basis resulting in some habitat damage by trampling. Changes in plant community composition in bottoms would not be documented, so the results of habitat management actions in these areas would not be detected and evaluated. Without expedited control, nonnative plants would continue to expand, reducing the amount of useable habitat for native wildlife. For specific effects of the levee modification project refer to the USFWS EA titled "Levee Removal Project of the Floodplain Habitat Restoration Program," (Appendix K). In areas without levee modifications, riparian and bottomland habitats would continue to degrade, nutrient cycling would decrease, and the amount of invertebrate plant foods for waterfowl would decline. Outbreaks of avian botulism would be harder to control with less personnel time available to clean up dead and dying waterbirds. Lack of seasonal River flows would inhibit new seedbed areas for cottonwood and willow regeneration. Cottonwood and willow stands would not reestablish or expand beyond their current extent.

Under traditional habitat management, the Refuge would not provide bottomland wetland habitat that supports endangered Colorado River fishes (other than that produced by the levee modification program currently being implemented). As riparian cottonwood stands degrade and mature trees fall, the available wintering bald eagle roost habitat would decline. With limited shallow wetland and wet meadow to attract shorebirds, avian predators such as the peregrine falcon would make less use of the Refuge. The Uintah Basin hookless cactus would not be directly affected by Alternative 1.

The Refuge would not provide diversified shallow water wetlands and moist soil habitats for migrating sandhill cranes, waterbirds and shorebirds. These habitats are very limited on the Refuge currently and would remain so. The Refuge would not attract or support many species that used seasonal Green River floodplain wetlands historically. Vegetative and invertebrate foods for migrating and breeding birds produced by shallow wetland plant communities would continue to be very limited. The production of mosquitos on Refuge wetlands would remain generally the same depending on the amount of habitat flooded during spring runoff.

Selenium may continue to accumulate in Sheppard bottom unless the decision is made to breach the protective levee to flush these soil accumulations into the Green River. Waterbirds would continue to be adversely affected, resulting in death and embryo deformations.

The condition of upland habitats would remain largely unchanged. However, with the continued invasion of nonnative plants, native plant communities near wetlands would slowly degrade and provide less quality habitat for terrestrial birds and resident wildlife. Monitoring programs for upland and grassland birds would not be developed, and declines in these species would not be detected or prevented by habitat improvements. The movement of pronghorn would continue to be restricted by impassible fences.

*Alternative 2* would result in more effective management of the Refuge's wetland and riparian habitats. Increased monitoring of species and habitat conditions would allow managers to detect problems, identify the specific needs of species of concern and provide them. Specific habitat needs of more migratory bird species would be identified and provided for. Site specific strategies to control nonnative plant species would restore native vegetation over time and increase the amount of quality habitat for migratory and resident wildlife. Nonnative plants, such as white top, may initially increase into newly flooded areas. However, flooding may be scheduled to favor native species and discourage nonnatives over time. Alterations in internal levees in bottoms would allow quicker manipulation of water levels and improve wetland soil nutrient cycling.

With more areas flooded seasonally to create shallow wetlands that support waterbirds and shorebirds, mosquito production may increase; however, much of the same area would dry up in summer, stopping larvae production sooner than in wetlands that currently hold water throughout the season. More dynamic changes in water levels in Refuge wetlands would also decrease the amount of stagnant water held behind levees that currently produces mosquitos.

Migratory bald eagles would benefit from improved wetland and riparian habitat conditions. Mature cottonwood trees used as perches would be protected from disturbance as in *Alternative 1*; however, newly regenerating cottonwood stands would guarantee perch trees for the future. With improved wetland conditions, an increase would occur in fish and bird prey for hunting eagles. Peregrine falcons would also benefit from increases in waterbird and shorebird prey availability.

As in *Alternative 1*, endangered fish species of the Green River would benefit from ongoing levee modifications. Under *Alternative 2*, levee modifications would continue to be carried out and evaluated. If these modifications contribute to increased native fish populations, more would be implemented in each bottom. As bottomland and riparian habitats improve in condition under *Alternative 2*, an increase would occur in protected rearing and spawning habitat for native fishes.

With the proposed removal of protective levee in Sheppard bottom, selenium concentration of these wetland soils would drop and fewer bird mortalities would be detected. If the decision is made not to modify this levee, the Refuge would divert and spread selenium laden water from Roadside Draw to speed evaporation, and plant trees and other vegetation to discourage use of open water by waterbirds. The concentration of selenium may still rise in soils in this area, but fewer birds would be ingesting it.



Under Alternative 2, no initial changes would occur to the condition of upland habitats. As baseline information on grassland wildlife and plant species is generated, habitat management plans for these areas would be developed. The condition of grassland and upland habitats would be maintained over time. When fences that currently block pronghorn movement through uplands are modified, pronghorn would again become part of the wildlife community and effects of their browsing would help maintain these areas in their natural state. Domestic and feral livestock would be controlled to avoid damage to these fragile arid habitats. As habitat and plant community data is collected, the Refuge would determine if an occasional disturbance by livestock or fire would improve grassland vigor.

*Alternative 3* would not initially change the condition of floodplain or riparian habitats on the Refuge until all protective levees along the Green River are breached. As wetland units currently holding water permanently drain and equalize with adjacent units, major changes would occur in water quality, salt, alkali deposits would be diluted and spread, nonaquatic vegetative cover may be drowned out, silts and organic wetland soils would move, and disturbances would occur to resident wildlife. In the first spring high River flow event after levee removal, scouring and erosion of Refuge riparian and wetland areas may occur as the Green River reestablishes channels through the floodplain. It may take several years for Refuge floodplain habitats to be restored to their productive conditions. An initial increase may occur in nonnative plant species around the perimeter of the new floodplain. As soils and silts redistribute themselves, riparian woodlands may shift in location, new willow and cottonwood seedlings would appear, and wetland plant communities would reestablish in new areas. The magnitude of these changes would depend on the discharge of the Green and Yampa Rivers in any given year.

Deposits of selenium would shift, but would probably be diluted throughout the floodplain and be flushed back into the Green River. Migratory birds would still find habitat for feeding and resting, and more mudflat and gravel bar habitat would exist for shorebirds. Instead of larger, stabilized deep water wetlands, more small shallow wetland pools that dry out in summer may form. The amount of robust emergent vegetation (bulrush and cattail) may decrease, providing less habitat for nesting bitterns and rails. The production of diving and dabbling ducks may decrease on the Refuge. As riparian and bottomland habitats reestablish themselves, more nesting and feeding habitat would be available for migratory passerine birds and colonial waterbirds such as herons. An increase in bottomland wetland habitat would support native fish species; an increase in their populations may occur. However, nonnative fish established in the Green River would also have access to these protected areas and would increase as well. Competition and predation of juvenile native fish would result.

Refuge activity in the floodplain would consist mainly of wildlife population monitoring including mosquito production, plant community sampling, and evaluation of safe access for recreational activity. Mosquito production would vary with the acreage of floodplain filled each year during spring runoff. The Refuge's ability to control or monitor mosquito production may decrease because of access to floodplain sites.

The condition of upland habitats would not change significantly except for relocating Refuge buildings and/or portions of the current auto tour route. The Refuge would minimize the amount of relocation and would avoid disturbing colonies of Uintah Basin hookless cactus. With Refuge floodplain habitats being "managed" by the Green River, Refuge staff would concentrate on determining the condition and species use of the upland and grassland portions of the Refuge. Management and monitoring plans for upland plant communities and wildlife would be developed. Nonnative plants would be aggressively controlled. Pronghorn would regain access to areas previously barred by fencing.

## B. Impacts to the Physical Environment

*Alternative 1* would have no measurable effect on the soils and air quality of the region. Water quality in Refuge wetlands and riparian areas may degrade slowly as the decline of riparian plant communities expose aquatic organisms to high summer temperatures and possible bank erosion. Overabundant emergent vegetation in Refuge wetlands and limited circulation of nutrients in impoundments may degrade water quality. Selenium would continue to accumulate in the Roadside Draw unless the Sheppard bottom protective dike is partially breached to increase flushing.

Refuge cultural and paleontological resources would continue to receive protection under this Alternative. Cultural resources are managed according to several Federal Acts. No ground disturbing activities are carried out without consulting the Utah State Historic Preservation Office.

*Alternative 2* would result in improved water quality in riparian habitats through restoration of sheltering willow and cottonwood communities that protect from high summer temperatures. Modifying internal levees, installing new spillways and water control structures, and periodically draining bottoms would recycle wetland soil nutrients and improve water exchange in these wetlands, improving water quality and wetland soil productivity. More efficient control of emergent vegetation would improve water quality for wetland dependent birds. Prescribed fire is used periodically to control nonnative plants and to open up vegetation-choked wetlands. Impacts to local air quality are minimal and state burning permits are not currently required. Repair and maintenance of fencing to exclude livestock would protect Refuge soils from compaction and trampling damage.

If the Sheppard bottom levee is breached, soil conditions would improve because the concentration of selenium would be lowered or dispersed.

Refuge cultural and paleontological resources would continue to receive protection under this alternative. Modification of bottomland levees, construction of spillways, or other ground disturbances would be reviewed by the Service's Regional Archaeologist; however, most of these floodplain sites have been disturbed in the past and known cultural or paleontological sites are either no longer discernable or have been obliterated by earlier construction.

*Alternative 3* would improve soil condition and water quality of the floodplain areas of the Refuge over time. Initially, increased erosion would occur of remaining dikes and roadbeds which may alter the water quality of the Green River; increased siltation, and redistribution of soil and gravel along the River downstream from the Refuge. Ouray Fish Hatchery facilities would need protection from increased flooding and erosion during high spring River flows. Refuge facilities and roads would either be relocated or would erode away as a result of protective levee removal. With levee removal, the Green River would again flow through the Refuge bottoms and wetlands, allowing nutrient and water exchange and redeposit of silt into wetland soils. Selenium entering the Refuge from Roadside Draw discharges would travel into the Green River system instead of settling out in Sheppard bottom soils. With more of the River passing through Refuge wetlands, the main channel current may decrease resulting in an increase in silt deposits and raising of the local River water temperature. Air quality in the area would be unaffected or minimally affected by a decrease in prescribed burning in wetland habitats. If, because of a decrease in management and maintenance of wetlands, the Refuge uses less than its appropriated water over a period of five years, some state water rights may be forfeited.

In the floodplain areas of the Refuge, no intact cultural or paleontological sites are remaining. Previously unknown sites may be damaged by River action; however, they may also remain undiscovered and protected from human disturbance. Any construction of new facilities or roads in Refuge uplands would be reviewed by the Service's Regional Archaeologist to avoid damage to unknown cultural sites.

## C. Impacts to the Human Environment

*Alternative 1* would allow minor continued improvements to the public use program. No significant changes would occur in public use of the Refuge but the visitor experience would have only minimal potential to improve. No significant changes would occur to the socio-economic condition of surrounding communities. Mosquito production on the Refuge would remain at its current level. The Refuge would continue to assist the Uintah County Mosquito Abatement District with sampling and localized control of larvae with BTI. The Refuge would not need to submit significantly higher budget or personnel requests to cover ongoing activities.

*Alternative 2* would result in improvements to basic visitor facilities, including interpretive signs, construction of information kiosks, and revision and development of leaflets which would clearly describe recreational opportunities, and Refuge specific regulations. Mosquito populations will be monitored to determine if changes in habitat management effect production.

This alternative would also provide for construction of nature trails in Sheppard and Leota bottoms, renovation of the auto tour route, and recruit a volunteer to guide tours for school and community groups in spring and fall. The visiting public would receive more quality experiences, and with expanded outreach into the local community, appreciation and understanding of the Refuge's role would increase. The Service's mission and the National Wildlife Refuge System purposes would be better understood and supported.

*Alternative 3* would have dramatic negative impacts to current recreational facilities. Restoring natural River flow regimes throughout the floodplain areas of the Refuge would regularly inundate portions of the existing auto tour route, observation sites, damage interpretive signs, outhouses, hunting areas, and observation points overlooking the farm fields. Until these facilities are relocated to higher ground, public recreational opportunities would be restricted. Until new interpretive sites and materials are developed to explain this management direction, visitors may not understand why this action was taken and may feel the Refuge has been abandoned. Prior to implementing this alternative, the Refuge would need to circulate information to local and regional media, local interest and sportsman's groups, contact adjacent landowners, and negotiate with the Ute Tribe over potential impacts to lands currently leased by the Service. Potential impacts to downstream property owners resulting from changes in the Green River channel would need to be determined.

Interpretive materials for visitors would need to be revised to explain the benefits and drawbacks to this management course prior to implementation. Safe access for hunting and fishing and potential hazardous conditions would need to be evaluated prior to allowing these activities after levees are breached. Mosquito production may increase with restored flooding of bottoms and riparian wetlands. However, these areas may also dry up sooner in the summer halting production sooner in the season. Mosquito production monitoring would continue, but access to some low lying areas may require boats, more personnel, and time. The amount of monitoring would probably decline. Treatment of localized areas with BTI may not be possible.

Once interpretive materials and sites are developed in upland areas, Refuge visitors would observe this portion of the Green River as it was prior to alteration by humans. The dynamic nature of seasonal River flows, functioning bottomland and riparian woodlands, and the wildlife that depends upon these habitats would be more clearly demonstrated and appreciated by the visiting public.

## D. Environmental Justice

In accordance with Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, Federal agencies must identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. This evaluation considered potential impacts arising under each of the three alternatives, including social, economic, cultural, physical, and biological resources.

As of 1998, census statistics record the Uintah County population as 25,660. The population is composed of 85 percent white, 10 percent Native American, 4 percent Hispanic, and less than 1 percent other minorities. Uintah County's primary industries are livestock production, agriculture, lumber, and mining (including oil and gas). The majority of the County is classified as rural. The economics of the area, including jobs and income, may change but not significantly, and no significant change in taxes or revenue from the Refuge is expected.

Current uses are not known to cause disproportionately high and adverse human health impacts in any population of Uintah County and no such impacts would be expected to occur as a result of the No Action or any action alternative. Current uses are also not known to result in disproportionately high or adverse socio-economic impact to low-income or minority populations, and no such impacts would be expected to occur as a result of any alternative.

# ***Appendix J. Final Environmental Assessment: Acquisition and Enhancement of Floodplain Habitats Along the Upper Colorado, Green, and Gunnison Rivers as Part of the Recovery Program For Endangered Colorado River Fishes.***

*Note: This appendix consists of excerpts from the final environmental assessment. Copies of the entire document are available upon request.*

## Introduction

### A. Purpose and Need for Action

Pursuant to the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) The Upper Colorado River Basin Recovery Implementation Program (Recovery Program) seeks to recover the endangered fishes identified within the basin, while allowing water development to continue. The loss of floodplain habitat is believed to be a factor contributing to the decline of these endangered fishes, and ultimately threatens their existence. To reverse this trend, the Recovery Program proposes to restore, enhance, and protect floodplain habitats to support the recovery of these species, namely the Colorado squawfish, razorback sucker, humpback chub, and bonytail.

### B. (Omitted)

### C. Background

The floodplain habitats described in this document are found within corridors along the mainstem rivers of the Upper Basin. These corridors have been designated as critical habitat for the razorback sucker, Colorado squawfish, bonytail, and humpback chub (except for the Delta to Austin reach of the Gunnison River). Critical habitat is that habitat essential to the conservation and recovery of endangered species. The Service is required to designate critical habitat under ESA. The biological support for the designation of critical habitat for the endangered fishes in the Colorado River system is provided by Maddux et al. (1993).

### D. Recovery Program

The Recovery Program is working to reestablish self-sustaining populations of the endangered fish in the Upper Basin. This is a cooperative effort among the Service; Reclamation; Western Area Power Administration; the States of Colorado, Utah, and Wyoming, water development interests; and environmental organizations. An important goal in this effort is seeking solutions for recovering endangered fishes while allowing water development to proceed in the Upper Colorado River Basin (U.S. Fish and Wildlife Service 1987a).

In order to allow continued development of water in the Upper Basin, the Recovery Program was developed to serve as a reasonable and prudent alternative to avoid jeopardy that could result from consultations related to Section 7 of the Endangered Species Act. A detailed description of the Recovery Program and an environmental assessment on its implementation have been prepared by the Service (1987a,b). A description of its evolution with other pertinent background information was prepared by Wydoski and Hamill (1991). Complete citations for this material can be found in Appendix C.

There are five major elements identified by the Recovery Program as critical for the recovery of the endangered fishes in the Upper Basin. These elements are:

- (1) flow management;
- (2) habitat enhancement and maintenance;
- (3) stocking of endangered fish;
- (4) management of nonnative fish and sport fishing; and
- (5) research, monitoring, and data management (U.S. Fish and Wildlife Service 1987a,b).

The proposed action entails the restoration, enhancement, and protection of habitats required by the endangered fishes via non-flow alternatives outlined in the second element of the Recovery Program.

### E. (Omitted)

### F. (Omitted)

### G. Importance of Floodplain Habitat to the Recovery of Endangered Fishes

The importance of land-water interface to a river system's productivity has been recognized for over twenty-five years (Allan 1995; Hynes 1970; Hynes 1983). The warmth of inundated floodplains, adjacent to rivers, results in an increased production of phytoplankton and development of a food web which supports the river ecosystem (Welcomme 1979). Warmer water temperatures combined with greater food production also results in faster growth rates for young fishes, thereby serving to increase the chances of survival because larger fish are less vulnerable to predation (Bestgen et al. 1997).

Inundated floodplains also provide a quiet-water shelter from main channel river currents. This reduction in energy expenditures of young fishes could be reserved for growth. Inundated floodplain vegetation also offers hiding places from predators (Modde 1997). Floods and floodplains are now understood to be essential components of river ecosystems (Sparks 1995).

The decline of the four native fish species in the Colorado River has been attributed to a lack of recruitment. High mortality during early life stages is believed to contribute to limited recruitment. Few larval razorback suckers are believed to survive to adulthood (Tyus and Karp 1990; Minckley et al. 1991; Modde et al. 1996).

After they hatch, young larval fish need food right away to survive. They must initiate feeding during the "critical period" after swimup or they will die from starvation (Miller et al. 1988). The "critical period" for larval razorbacks lasts from about 7 to 21 days after hatching (Minckley et al. 1991). The larvae and juveniles of all endangered Colorado River fishes feed on zooplankton (Miller et al. 1982). Inundated floodplains have proven to produce the highest densities of zooplankton (Welcomme 1989).

These off-channel habitats not only produce food of the proper quantity and size, they produce this food at the time it is needed by the larval fish (Modde 1997). Finding ways to increase zooplankton production in off-channel habitats is expected to increase the survival of young fish.

## H. Distribution of Floodplain Habitat

Bottomland habitats were inventoried during 1993 by Irving and Burdick (1995). Along the Green River, the highest concentration of floodplain habitats is located between Pariette Draw and Dinosaur National Monument (Figure 1-5). Along the Colorado and Gunnison rivers, the highest concentrations of habitats are located within three general areas (Figure 1-3):

- (1) the Colorado River between Rifle and DeBeque, Colorado;
- (2) the Grand Valley reach of the Colorado River between Fruita (Loma) and Palisade, Colorado;
- (3) the Gunnison River near Delta, Colorado.

Criteria used to identify parcels of land suitable for acquisition and restoration as floodplain habitat are:

- (1) Biological Importance - areas where razorback suckers currently reside and/or they were historically common to abundant;
- (2) "Floodability" - areas that currently flood or can be made to flood at lower flows;
- (3) Contaminants - sites which are not contaminated; and
- (4) Size - parcel's surface area.

An estimated 3,588 acres of bottomland along the Upper Colorado River meet these criteria. These lands are adjacent to 113 miles of river between Westwater Canyon (Loma) at the Colorado-Utah State line and Rifle, Colorado. Razorback suckers are believed to have been historically abundant in this area (Quartarone 1993). Below Palisade, this reach is also a high concentration area for adult Colorado squawfish, and includes larval nursery areas and historical spawning sites.

Floodplain habitats that meet the above criteria along the Gunnison River are estimated at 774 acres primarily in a 25-mile reach from River Miles 50 and 75 (Nelson 1996, 1997). A remnant population of Colorado squawfish is still found in the Gunnison River but razorback suckers apparently no longer inhabit the river (Burdick 1995) except for those that have been recently stocked. The Gunnison River between Austin and Delta, Colorado historically contained large numbers of razorback suckers (Quartarone 1993).

Bottomland habitats along the Colorado and Gunnison rivers consisted of 48% floodplain terraces, 18% gravel-pit ponds (depressions), 15% side channels, and a 19% mix of other types of habitat. Levees isolate 49.5 miles of habitat from the river (Irving and Burdick 1995).

Along the Green River, floodplain habitats that meet the above criteria are estimated at 11,428 acres on privately-owned properties and 6,000 acres on Tribal lands, primarily concentrated in the 80 mile reach from the boundary of Dinosaur National Monument at River Mile 318 downstream to Pariette Draw at River Mile 238 (Irving and Burdick 1995; Nelson 1996, 1997). Floodplain habitat in this area consists of 75% terraces and 25% depressions. Approximately 15% of the 132 potential bottomland sites along the Green River are isolated from the river by levees, preventing approximately 20 miles of the Green River floodplains from connecting to the river during high stream flows (Irving and Burdick 1995). Razorback suckers spawn during high spring flows upstream of this reach and newly hatched larvae drift downstream. Survival of these larvae are expected to increase if they had access to productive floodplain habitats. This reach of the Green River is especially important to recovery of the razorback sucker because it contains the largest number of adult razorbacks known to occur in the Upper Basin and the largest natural riverine population in the entire Colorado River system (Tyrus 1997).

## II. Alternatives

A. (Omitted)

B. (Omitted)

### C. Alternatives Considered

To provide and protect floodplain habitat to assist in recovery of the endangered fishes, three alternatives were identified and considered by the interdisciplinary team charged with preparing this environmental assessment. A description of each of the three alternatives follows:

#### 1. The No Action Alternative

The No Action Alternative is the foreseeable future without the project. This alternative suggests a continuation of the status quo. Habitat quality and quantity, which is already not sufficient to achieve or sustain recovery, can be expected to continue to degrade as water development and floodplain development continue. The ecosystem food supply will continue to diminish, affecting all species, including the endangered fishes. Razorback sucker recruitment can be expected to decrease, likely resulting in ultimate extinction for that species. The bonytail may be declared unrecoverable if it is determined that the loss of food supplied by the floodplain is a major limiting factor.

#### 2. Induce Flooding

To provide habitat for endangered fishes, floodplain areas could be inundated by acquiring and releasing large amounts of water from reservoirs during spring runoff. This alternative may restore enough habitat needed for recovery, even if nothing is done to reconnect the 70 miles of bottomland habitat that has been disconnected from the river via flood control levees within the high-priority geographic areas of the Upper Basin (Figures 1-3 and 1-5). However, induced flooding would inundate properties of private landowners without their permission, no doubt resulting in undue hardships. Also, the costs associated with acquiring the amount of water necessary to induce flooding, with litigation, and with paying for flood damages would be extraordinarily high.

#### 3. Protect and Enhance Flooded Bottomlands to Take Advantage of Available Flows

Alternative #3 would entail entering into agreements with and/or acquiring rights from willing landowners to protect and enhance floodplain habitat to benefit the endangered fishes. A variety of tools could be used to accomplish habitat protection, including the development of agreements, partnerships, acquisition of easements, donations, and exchanges. Floodability enhancements could be accomplished, where warranted, via excavation, which may include breaching dikes and levees. All acquisitions, agreements, and habitat enhancements would be done with willing sellers and willing participants. Under this alternative, there would be no condemnation, no acquisition of water rights, and no requests for flood flows.

A willing landowner could *voluntarily* (i.e., without the expectation of compensation) provide the habitat through an agreement, donation, exchange, or partnership; or the landowner could be *compensated* for providing and protecting habitat *by selling* an easement, lease, or in fee. The approach selected and used for any given property would depend on the wishes of the landowner.



## Introduction

This supplement describes and enhances the preferred alternative in the programmatic *Final Environmental Assessment for the Acquisition and Enhancement of Floodplain Habitats along the Upper Colorado, Green, and Gunnison Rivers as part of the Recovery Program for Endangered Colorado River Fishes*.

Through a cooperative effort, the Upper Colorado River Basin Recovery Implementation Program (Recovery Program) was formed to recover endangered fishes in the Upper Colorado River drainage basin, while allowing water development to continue. The Recovery Program is seeking opportunities to restore, enhance, and protect floodplain habitats to support the recovery of endangered fishes, which include the Colorado squawfish, razorback sucker, humpback chub, and bonytail. To achieve the habitat protection goal, the Recovery Program has completed the above mentioned Environmental Assessment. The programmatic Environmental Assessment evaluates the effects of the land acquisition program which emphasizes the use of conservation easements for habitat protection within the Upper Colorado River drainage basin.

The supplement to the Environmental Assessment clarifies the Service's goals and purposes of accepting conservation easement transfers from the U.S. Bureau of Reclamation for the protection of fish and wildlife habitat by holding and managing the easements as a unit of the National Wildlife Refuge System. While conservation easements will be the primary acquisition interest, other acquisition interests include cooperative agreements and fee title acquisition.

The preferred alternative was selected for implementation because it best meets the underlying need for the proposed action. The underlying need to which the U.S. Fish and Wildlife Service is responding is the opportunity to accept conservation easements from Reclamation, and to hold and manage those easements by way of the National Wildlife Refuge System. The selection of the no action alternative would not allow the Service to respond to this need. The preferred action alternative would also allow the Service to acquire easements if funding was available.

## Preferred Alternative

Under the preferred alternative of the EA, as described on page II-2, Reclamation would acquire conservation easements from willing landowners to protect and enhance floodplain habitat to benefit endangered fishes. Using four biological criteria to identify parcels of land suitable for easement acquisition and restoration (EA, page I-4), the Recovery Program identified the portions of river corridors for habitat protection. After acquisition of an easement, Reclamation would transfer the easements to the Service (EA, page II-4), and the easements will be included in a new approved Unit of the National Wildlife Refuge System for protection and management as a Wildlife Management Area. The Refuge WMA will have a boundary that will include up to 10,000 acres on the combined river reaches of the Upper Colorado, Gunnison, and Green River system as described below:

- \* **Upper Colorado River**  
Approximately an area between river points of Weatwater Canyon at the Colorado-Utah State line and Rifle, Colorado, with the extent of 3,500 acres.
- \* **Gunnison River**  
Approximately 25-mile reach between River Miles 50 and 75 with the extent of 750 acres.
- \* **Green River**  
Approximately 80-mile river reach from the boundary of Dinosaur National Monument at River Mile 318 downstream to Pariette Draw at River Mile 238 with an extent of 5,750 acres.

Under this Alternative, the Service will accept conservation easement transfers from Reclamation for the protection of fish and wildlife habitat, and those lands will be administered in accordance with the National Wildlife Refuge System Administration Act and other relevant legislation, executive orders, regulations, and policies. Through the easement program, the landowner would agree to allow management and protection activities that would include monitoring the status and recovery of endangered, threatened, and sensitive species and coordinating other management activities with State and Federal agencies. Public use would be permitted only with the concurrence of the landowner and when it is compatible with the mission of the National Wildlife Refuge System and the Refuge WMA purposes. While the initial acquisition of easements will be accomplished by Reclamation, the Service will also acquire easements in the future if additional funding becomes available.

# ***Appendix K. Environmental Assessment: An Element of the Recovery Program for Endangered Fish Species in the Upper Colorado River Basin: Levee Removal Project***

*Note: This appendix consists of excerpts from the Levee Removal Project Environmental Assessment. Copies of the entire document are available upon request.*

## FINAL ENVIRONMENTAL ASSESSMENT

### LEVEE REMOVAL PROJECT OF THE FLOODPLAIN HABITAT RESTORATION PROGRAM

An Element of the Recovery Implementation Program  
for Endangered Fish Species  
in the Upper Colorado River Basin

Department of the Interior

LEAD AGENCY:  
Bureau of Reclamation  
Upper Colorado Region  
Provo Area Office

COOPERATING AGENCIES:  
Bureau of Land Management - Vernal District  
U.S. Fish and Wildlife Service - Ouray National Wildlife Refuge  
Bureau of Indian Affairs - Ft. Duchesne, Utah

FEBRUARY 1997

# CHAPTER 1. PURPOSE AND NEED FOR THE PROPOSED ACTION

## 1.1 PROPOSED ACTION

The Bureau of Reclamation (Reclamation), in cooperation with the Bureau of Land Management (BLM)-Vernal District, the U.S. Fish and Wildlife Service-Ouray National Wildlife Refuge (NWR) and the Bureau of Indian Affairs, proposes to implement the Levee Removal Project. The project would restore the connection between the Green River and floodplain habitats at up to eight sites located between Jensen, Utah and Ouray, Utah (Figure 1). This would be accomplished by removing or altering portions of natural and man-made levees and constructing, where necessary, features or facilities to restore the connection of floodplain habitats to the river. Such features or facilities could include ditches, canals, channels, bays, dikes or other features necessary to allow the Green River to begin to inundate the floodplain habitats when flows in this reach of the river are 13,000 cubic feet per second (cfs) or greater. Prior to operation of Flaming Gorge Dam, flows of 20,000 cfs inundated floodplain habitats almost annually. Today, 13,000 cfs would inundate floodplain habitats at the same frequency as prior to operation of the dam if the connection of the floodplain habitats were restored. Implementation of the proposed sites for this project have been identified as high priority sites for potential restoration of natural floodplain habitats. They are believed to be important to the endangered razorback sucker (*Xyrauchen texanus*) of the Colorado River system. The Colorado squawfish (*Ptychocheilus lucius*) is also expected to benefit from the proposed action.

## 1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Floodplain Habitat Restoration Program is to aid in the recovery and delisting of the four endangered fishes so they will not need the protection of the endangered Species Act. This purpose is to be accomplished in a manner that allows water development to proceed and does not disrupt State and tribal water rights systems, interstate compacts and court decrees (FWS 1987a). The purpose of the proposed action is to restore or enhance the natural floodplain functions that support recovery of endangered fishes in the Upper Colorado River Basin. The natural floodplain functions include provision of food, enhance water temperatures, high water quality, shelter from high water velocities, vegetative cover for predator avoidance, nursery rearing habitats and spawning habitats.

The proposed action is needed because: (1) the populations and critical habitat of the four endangered fishes in the Upper Colorado River Basin have been adversely affected or modified by water development and other activities; (2) the flooded bottomland habitats have been hydrologically cut-off from the main channel of the Green River and no longer provide the natural floodplain functions believed to be essential to endangered fish; (3) the Floodplain Habitat Restoration Program is a key element of the Recovery Program to offset the adverse effects of flow depletions from the Green River and allow water development in the Upper Colorado River basin; and (4) there is a need to continue evaluating the response of the river ecosystem to flooding bottomland habitats.

## 1.3 BACKGROUND

Historically, upper Colorado River basin floodplains were frequently inundated during spring runoff, but today much of the river is channelized by levees, dikes, riprap and vegetation, such as tamarisk. As a result, the hydrologic connection between the floodplain habitats and the river has been diminished or eliminated. Fish access to these floodplain habitats has been further reduced by decreased spring flows due to upstream water impoundment by dams or diversions. Numerous studies have suggested the importance of seasonal flooding to river productivity. When floodplain habitats are available, razorback suckers use them extensively for feeding prior to and after spawning and may also have spawned in such sites. Colorado squawfish also use these areas for feeding migrating to spawning areas. The Green River downstream of Flaming Gorge Dam formerly provided habitat for all four of the endangered fishes. However, after the dam was closed in 1964, these warmwater species disappeared in the reach between the dam and the confluence with the Yampa River. Colder water temperatures are presumed to be unsuitable and may be the primary reason for the absence of the endangered fishes there.

## 1.4 (omitted)

## 1.5 RELATIONSHIP TO OTHER PROJECTS

This project is a key element of the Floodplain Habitat Restoration Program of the *Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin* (Recovery Program) (FWS 1987a). It is also an element of the *Recovery Implementation Program Recovery Action Plan* (RIPRAP) (FWS 1994) for the Recovery Program. The RIPRAP was developed by the Recovery Program participants (U.S. Fish and Wildlife Service, Reclamation, Western Area Power Administration and the States of Wyoming, Colorado and Utah) in support of the Section 7 Agreement. It identifies specific actions and time frames believed to be required to recover the endangered fishes in the most expeditious manner in the Upper Colorado River Basin. The RIPRAP serves as the measure of accomplishment so that the Recovery Program can continue to serve as the reasonable and prudent alternative to avoid the likelihood of jeopardy to the continued existence of the endangered fishes, as well as to avoid the likely destruction or adverse modification of critical habitat. The RIPRAP describes important elements of habitat protection including: (1) restoring and managing in-channel habitat and historically flooded bottomland areas; (2) restoring passage to historically-occupied river reaches; (3) enhancing water temperatures; (4) reducing or eliminating the impacts of nonnative fishes and sportfishing; and (5) continuation of the Interagency Standardized Monitoring Program. The RIPRAP contains specific tasks to identify and restore important bottomland habitat. The Recovery Program has conducted an inventory of all bottomlands adjacent to mainstem upper basin rivers and has classified them according to their potential value to endangered fish recovery.

The proposed action is related to other actions being undertaken through the Recovery Program, such as operation of Flaming Gorge Dam to provide flows at the times, durations and magnitudes that more closely mimic the natural hydrograph of the Green River to benefit and protect endangered fishes. However, implementation of this proposed project is not contingent on the operation of Flaming Gorge Dam to benefit and protect endangered fishes. It is designed to function with the present flow regimes in this reach of the Green River provided by Flaming Gorge Dam and the Yampa River.

This project is related to similar floodplain habitat restoration activities on the Colorado River near Grand Junction, Colorado. It is also related to ongoing efforts of the U.S. Fish and Wildlife Service to negotiate easements with willing private landowners along the Green River for floodplain habitat restoration on private lands. The success or failure of this project would influence the need to apply similar efforts on private lands along the Green River. The Bureau of Land Management (BLM), U.S. Fish and Wildlife Service and Bureau of Indian Affairs (BIA) have participated as cooperating agencies in preparation of this EA because they are the major land management agencies where the Program would be implemented.

(Next paragraph omitted- discussed selenium contamination in Stewart Lake, Utah)

## 1.6 (omitted)

## CHAPTER 2. PROPOSED ACTION AND ALTERNATIVES

### 2.1 PROCESS USED TO DEVELOP ALTERNATIVES

Potential alternative courses of action were developed and considered by Reclamation. The range of alternatives was limited to those determined to meet the purpose and need for the proposal. Other alternatives considered are also described in this chapter and the reason(s) they were eliminated from further consideration are discussed.

### 2.1 ALTERNATIVES ANALYZED

**“NO ACTION” ALTERNATIVE** - The NEPA requires consideration of the “No Action” alternative. It serves as the baseline for which to compare the environmental effects of the proposed action and other alternatives. In this case, “No Action” means that the Levee Removal Project would not be implemented. Restoration of the physical hydrologic connection between the river and the floodplain habitats would not occur. However, flooding of floodplain habitats may occur as a result of natural hydrologic conditions when flows in the river are sufficient to overtop the existing levees, dikes, berms, or vegetation. Present land uses and resource trends would continue.

**PROPOSED ACTION ALTERNATIVE** - Reclamation, in cooperation with the BLM and Ouray NWR, would implement the Levee Removal Project at up to eight sites located adjacent to the Green River between Jensen, Utah, and Ouray, Utah (Figure 1 and Table 2.1). The proposed sites have been identified as high priority sites for potential restoration of natural floodplain habitats.

<b>Table 2.1 Levee Removal Project General Description of Project Site (Abbreviated)</b>			
<b>Site Name</b>	<b>Estimated Area to be flooded</b>	<b>River Mile</b>	<b>Landowner</b>
Bonanza Bridge	17.2 acres	290	BLM
Horseshoe Bend	18.4 acres	285	BLM
The Stirrup	19.2 acres	276	BLM
Baerer Bend	38.2 acres	273	BLM
Above Brennan	40.7 acres	268.5	BLM
Johnson Bottom	19.8 acres	261	Ouray NWR
Leota Bottom	58.7 acres	258.5	Ouray NWR
Old Charlie (diked)	87.2	251	Uintah-Ouray Tribe (leased by Ouray NWR)

**Pre-Project Evaluation and Monitoring Activities** - Pre-project studies will be conducted to establish existing biological, physical and chemical conditions so that environmental responses to levee removal can be monitored and evaluated. Researchers from Utah State University, Colorado State University, Utah Division of Wildlife Resources, U.S. Fish and Wildlife Service and private consultants have been collecting pre-project baseline data at the proposed project sites to describe native and nonnative fish species composition and abundance, fish food organisms and water quality, riparian and wetland vegetation and geomorphology. This data will be used to develop the pre-restoration “before” picture of each proposed project site.

**Construction Features** - The project would restore the hydrological connection of up to eight floodplain habitats to the Green River by removing or breaching portions of natural or man-made levees and constructing, where necessary, features or facilities to restore the connection of historic floodplain habitats to the river. Such features or facilities could include ditches, channels, dikes or other features necessary to allow the river to begin to inundate the floodplain habitats when flows in the reach of the Green River adjacent to the project sites are 13,000 cubic feet per second (cfs) or greater. The connection may consist of one or more levee breaches, inlets, outlets or both depending on specific design criteria at each site. Table 2.2 and the figures describe and portray the design and construction specifications of the project sites. Typical equipment used for the construction would be a trackhoe, backhoe, excavator, patrol and dump truck. Existing roads would be used for construction access to all sites. No new roads would be constructed. The area inundated at each project site would vary in size from 17 to 87 acres (see Table 2.1) depending upon location, topographic and hydrologic conditions induced at the sites as a result of the levee removal.

**Operation and maintenance** - Each project site would be designed to operate naturally, meaning that they would begin to inundate when river flows exceed 13,000 cfs. There would be no water control or release structures installed, except at the Leota Bottom L-7a site where a water outlet structure would be installed. The sites would be designed to be self-maintaining to the extent practicable. There may be periodic removal of sediment required where the levee breaches have been constructed. The Recovery Program would take responsibility for ongoing maintenance that may be required.

**Construction Schedule** - The project is proposed to be implemented over a two-year or longer period. Prior to the 1997 spring runoff, levees would be breached at up to five sites: Bonanza Bridge, Horseshoe Bend, The Stirrup, Leota Bottom L-7a and Old Charlie (diked). However, the Old Charlie (diked) site would be implemented only after written permission to proceed is received from the Tribe. Depending on the post-project monitoring and evaluation of these sites, the remaining five sites would be implemented in 1998 or later prior to the spring runoff.

**Post-Project Monitoring and Evaluation** - The same studies conducted for the pre-project monitoring would be collected after the levee removal is completed at each site. This data would be used to develop the "after" picture. This monitoring and evaluation would continue through at least 1999. Based on results of the monitoring and evaluation studies, the Recovery Program will decide if modifications are needed and should be made to site design and configuration which have been restored previously and sites targeted for future levee removal. While no problems are anticipated at this time, if there are unforeseen difficulties or problems at any of the project sites, the Recovery Program would be responsible for taking appropriate corrective actions, which could include filling or restoring the breach made in the levee(s).

### 3.9 SUMMARY OF IMPACTS

The predicted impacts of the alternatives are summarized in Table 3.5.

<b>Table 3.5 - Levee Removal Project EA Summary of Impacts</b>		
<b>Resource Issue</b>	<b>No Action</b>	<b>Proposed Action</b>
Special Status Species	The population of endangered fish endemic to the Green River would likely continue to decline and critical habitat would be adversely modified.	The project, as proposed, is not likely to jeopardize the continued existence of the razorback sucker and Colorado Squawfish and is not likely to destroy or adversely modify designated critical habitat for those species. It also stated that the project may affect the bald eagle; no effect on other species.
Vegetation and Soils	No effect.	15.0 acres of existing vegetation and soils directly impacted by construction activity to remove levees; disturbed areas would be revegetated.
Wetland and Riparian Areas	No effect.	10.5 acres of existing vegetation removed by levee breaching; 299.4 acres of existing floodplain wetland and riparian areas annually inundated for 1-2 months; disturbed areas would be revegetated.
Landownership and Land Use	No effect.	No effect on landownership; some existing land uses such as grazing could be affected.
Recreation	No effect.	No effect on recreation uses; public access to portions of the project sites would be restricted during construction activity for safety purposes.
Cultural Resources	No effect.	No historic or prehistoric cultural resources affected.
Fish and Wildlife	No effect.	10.5 acres of wildlife habitat disturbed due to construction impacts; temporary impacts due to human activity at the project sites. Native and nonnative fish populations would increase.
Water Quality	No effect.	No effect on contaminants such as selenium; short-term, temporary impacts to water quality could result from construction activity in or near river channel.
Indian Trust Assets	No effect.	Tribally-owned lands used for project; existing tribal uses continued; no adverse impact on trust assets.
Vectors and Noxious Weeds	No effect.	No increase in mosquitoes; potential increase in whitetop.

## ***Appendix L. Water Rights***

Ouray National Wildlife Refuge currently holds water rights from the Green River for 139.06 cfs for fish and wildlife propagation and the irrigation of 6,185 acres, for a total of 23,452 acre-feet, *of which 9,026 acre-feet is returned to the River*, for a total consumptive use of 14,108 acre-feet annually. This water is diverted by stationary and portable pumps anywhere on the Green River between a point N 13 degrees 24' W 2167.8 feet from the SE corner Section 24, T7S, R20E, SLB&M and an point E 2175 feet and S 3000 feet from the NW corner Section 22, T8S, R20E, SLB&M.

The Refuge is currently the focus of a portion of the *Colorado River Recovery Plan* and is the location of the Ouray National Fish Hatchery. The Hatchery utilizes a well field at the NEW hatchery site in Section 29 that consists of six wells totaling 600 gpm from the River alluvium, which are covered under the above listed surface water rights.

The Hatchery (OLD site) is supplied by five wells in Section 11 that are covered under State permit for a total of 135 gpm.

Finally, the Service also owns 700 shares of stock in the Ouray Park Irrigation Company. Each share is equivalent to 2.7 acre-feet in a “normal” year for a total of 1,890 acre-feet. See below for a complete listing of water rights.

\* Refuge "commingle" applications total diversion rate of 139.06 cfs up to 23,134 AF diverted with 9,026 AF returned to the Green River for a total consumptive use of 14,108 AF.

OURAY NWR AND NFH  
 UTAH COUNTY, UTAH  
 WATER RIGHTS

12/06/99

\*\* Shares in Ouray Park Irrigation Company.

APPL. NO.	CHANGE APPL. NO.	CERT. NO.	WATER RIGHT#	AREA CODE	**	TYPE WORKS	TYPE USE	PRIORITY DATE	POINT OF DIVERSION COMPASS	SEC	TWN	RGE	RATE CFS	AF SEASONAL	RATE GPM
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STATION: OURAY NFH

SOURCE: GROUNDWATER

F-63102			43-10026			WELL #2	FC	03/01/88	NW NW SW	11	08S	20E	0.00	0.80	30
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REMARKS: NFH-20 YR FIXED TIME APPL. For use w/43-10026 & 43-9948, Colorado River Fishery Proj.

A-64552			43-10209			WELL #7	FC	04/06/90	NW NW SW	11	08S	20E	0.00	0.00	45
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REMARKS: NFH-Well not yet drilled. No #. For use w/43-10026 & 43-9948 Colorado River Fishery Proj.

	a-15198		43-9948			WELL #4	FC	05/19/92	NE NE SW	11	08S	20E	0.00	0.00	20
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REMARKS: NFH-Replace Abandoned Well #3. For use w/43-10026 & 43-9948, Colo. River Fish. Proj.

	a-15198		43-9948			WELL #5	FC	09/20/96	NE NE SW	11	08S	20E	0.00	0.00	20
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REMARKS: NFH-supplemental to well #4. For use w/43-10026 & 43-9948, Colo River Fishery Proj.

A-62171			43-9948			WELL #1	FC	11/18/86	NE NW SW	11	08S	20E	0.00	0.80	20
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REMARKS: NFH-Renovated in '91. Use w/43-10026 & 43-9948, Colo. Rvr. Fish. Proj. (POD #2)

SOURCE: GW (RIVER ALLUVIUM)

						WELL FIELD	FC	05/11/92	NW	29	07S	20E	0.00	657.00	600
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REMARKS: NFH-Well Field (6) non-cons use covered under Refuge surface water rights per 5/11/92 memo.

STATION: OURAY NWR

SOURCE: GREEN RIVER

34752	a-6977*		43-3670			PUMPS	F,I	12/05/62	***	***	***	***	67.47	4,763.88	0
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REMARKS: \* COMMINGLED RIGHTS \*\*\* ALONG GREEN RIVER WITHIN REFUGE BOUNDARY

\* Refuge "commingle" applications total diversion rate of 139.06 cfs up to 23,134 AF diverted with 9,026 AF returned to the Green River for a total consumptive use of 14,108 AF.

OURAY NMR AND NFH  
UNITAH COUNTY, UTAH  
WATER RIGHTS

12/06/99

\*\* Shares in Ouray Park Irrigation Company.

APPL. NO.	CHANGE APPL. NO.	CERT. NO.	WATER RIGHT# AREA CODE	** SHARES	TYPE WORKS	TYPE USE	PRIORITY DATE	POINT OF DIVERSION COMPASS	SEC TWN RGE	RATE CFS	AF SEASONAL	RATE GPM
27874	a-4375*		43-3539		PUMPS	F,I	02/15/56	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
18716	a-6981*		49-1676		PUMPS	F,I	05/02/47	***	***	3.56	453.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
24847	a-6979*		49-197		PUMPS	F,I	02/14/56	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
26264	a-4375*		43-3514		PUMPS	F,I	09/20/54	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
27586	a-4375*		43-3537		PUMPS	F,I	11/07/55	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
24849	a-6980*		49-80		PUMPS	F,I	05/01/53	***	***	10.00	898.28	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
24414	a-6979*		49-190		PUMPS	F,I	03/04/65	***	***	25.00	4,792.68	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
24848	a-6979*		49-198		PUMPS	F,I	05/01/53	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
24875	a-6979*		49-200		PUMPS	F,I	05/11/53	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
24424	a-4375*		43-3466		PUMPS	F,I	05/06/58	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
25595	a-4376*	5521	43-3509		PUMPS	F,I	02/26/54	***	***	3.03	562.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												
17858	a-6976*	6104	49-179		PUMPS	F,I	07/17/46	***	***	2.00	510.16	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY												



\* Refuge "commingle" applications total diversion rate of 139.06 cfs up to 23,134 AF diverted with 9,026 AF returned to the Green River for a total consumptive use of 14,108 AF.

OURAY NWR AND NFN  
UTAH COUNTY, UTAH  
WATER RIGHTS

12/06/99

\*\* Shares in Ouray Park Irrigation Company.

APPL. NO.	CHANGE APPL. NO.	CERT. NO.	WATER RIGHT#	AREA CODE	**	TYPE	WORKS	TYPE	USE	PRIORITY DATE	COMPASS	POINT OF DIVERSION	SEC	TWN	RGE	RATE CFS	AF SEASONAL	RATE GPM
21883	a-4375*		43-3413			PUMPS		F,I		04/22/57	*	***	***	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY																		
21882	a-4375*		43-3412			PUMPS		F,I		07/03/50	***	***	***	***	***	28.00	2,168.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY																		
24850	a-6979*		49-199			PUMPS		F,I		05/01/53	***	***	***	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY																		
25180	a-6980*		43-2513			PUMPS		F,I		06/21/56	***	***	***	***	***	0.00	0.00	0
REMARKS: * COMMINGLED RIGHTS *** ALONG GREEN RIVER WITHIN REFUGE BOUNDARY																		

SOURCE: GROUNDWATER

A-35346			43-3711			WELL		D,I		05/16/63	SE SW NE	11	08S	20E		0.50	0.00	0
REMARKS: REFUGE DOMESTIC SUPPLY.																		

SOURCE: PELICAN LAKE

		479				HEADGATE		I		/ /		03	08S	20E		0.00	480.00	0
REMARKS: OURAY PARK IRRIG CO. FMHA TR (64) APPROX 3 AF PER SHR.																		

		513				HEADGATE		I		/ /						0.00	1,200.00	0
REMARKS: OURAY PARK IRRIG CO. APPRX 3 AF PER SHARE-TOTAL 2100 AF. SEE CERT 351,352,513																		

		352				HEADGATE		I		/ /						0.00	600.00	0
REMARKS: OURAY PARK IRRIG CO. APPRX 3 AF PER SHARE-TOTAL 2100 AF. SEE CERT 351, 352, 513																		

		351				HEADGATE		I		/ /						0.00	300.00	0
REMARKS: OURAY PARK IRRIG CO. APPRX 3 AF PER SHARE-TOTAL 2100 AF. SEE CERT 351, 352, 513																		

